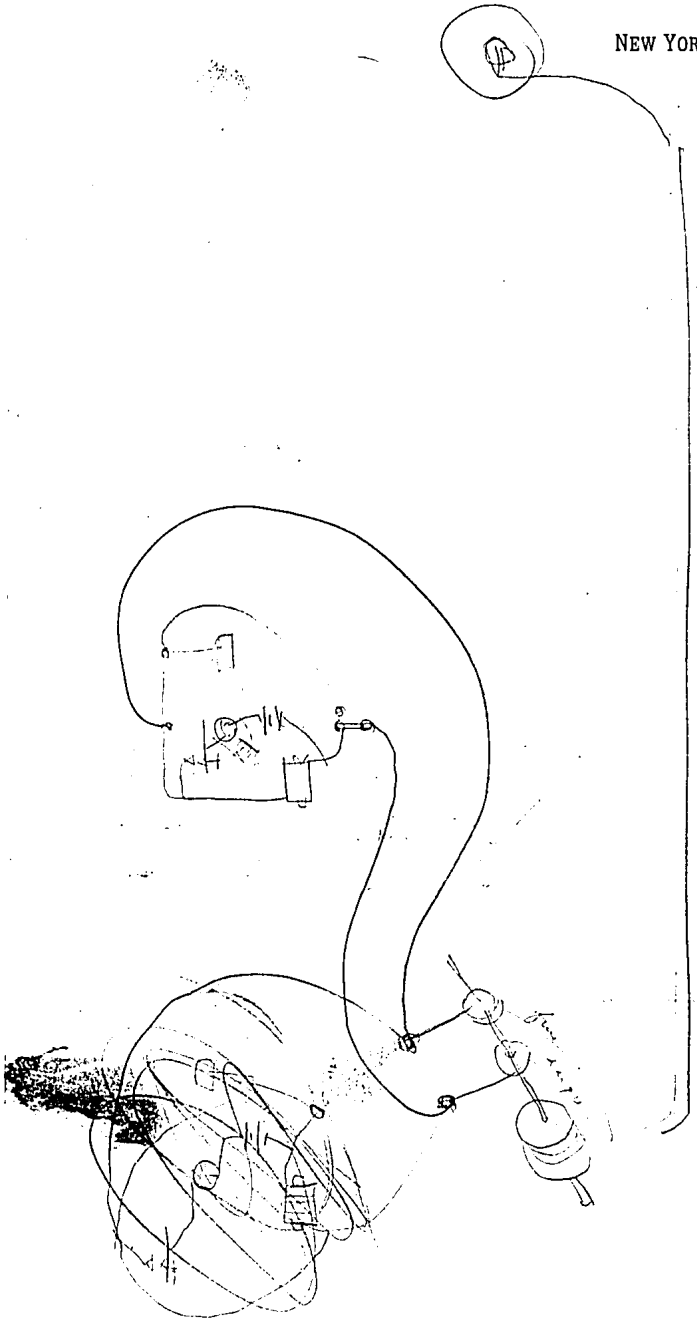
Technical Scrapbook, Cat. 1151

This scrapbook covers the period January 1885-December 1886. There is also one document from 1889. The entries are by Edison. Included are numerous notes and drawings relating to lamps, along with occasional material about other parts of the electric lighting system, such as generators, meters, and regulators. There are also many notes and drawings dealing with telegraphy, including the phonoplex, railway telegraph, quadruplex, sextuplex, and air or balloon telegraph. There is also a description of a method for producing artificial mother of pearl. Many of the entries contain notes by Edison to Richard N. Dyer, his patent attorney. The name of Edward C. Rowland, Edison's patent draftsman, appears as a witness on many of the documents. The case number of Edison's patent application has been written on some of the items.

CABLE ADDRESS—EDISON, NEW YORK.

THOMAS A. EDISON,
NO. 65 FIFTH AVENUE.

NEW YORK, ...188



made sketches of this

Saturday Jan 22nd 1863

E L B

Subject.

W.H. FORBES, PRESIDENT.

Wm. R. DRIVER, TREASURER.

THE AMERICAN BELL TELEPHONE CO.

THEO. N. VAIL, GENERAL MANAGER.

~~No. 95 MILK STREET.~~

P. O. DRAWER 2.

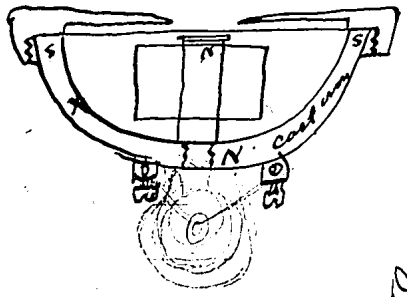
Boston, 188

No.

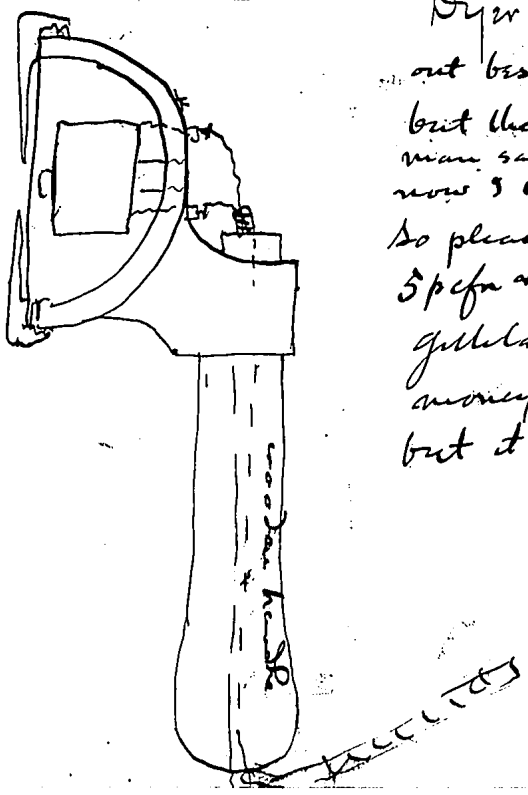
In reply to yours

Thus wooden handle broken
the cowhorn shown
Yr Mr. Hale Adm. Co. Boston
Mr. Hale. Not done this or similar

Wherever pole —
In telephone Receiver a cast iron or steel pole
Frosch form are permanently magnetized pole upon which rests the diaphragm
rests the bottom of the cast iron pole piece which thus
rest on an annular ring of the diaphragm
pole is in close proxy to the centre of pole diaphragm



X Cast iron hardened & magnetized - or Cast steel - or dropped steel =



Dyer = Gilliland has got out best receiver I ever saw but the Co's patent man says nothing patentable now I think there is

So please draw up a brief Spec & claims & send on to Gilliland - There's no money in it for you directly but it will help you

Feb. 85

1st side elevation
2 - rear section line 2
3 - hor. " 3 - 3

Dec 54

THOMAS A. EDISON,
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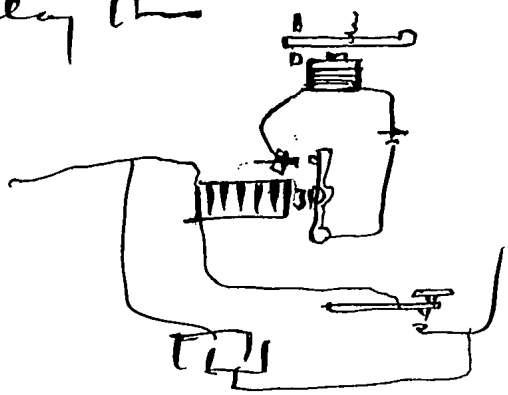
NEW YORK, ... 188

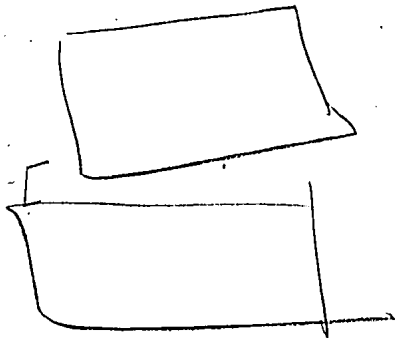
Eck

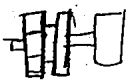
On regular morse set in drawing you show 2 relays one of which you call a sounder it is customary to make sounder different from Relay the

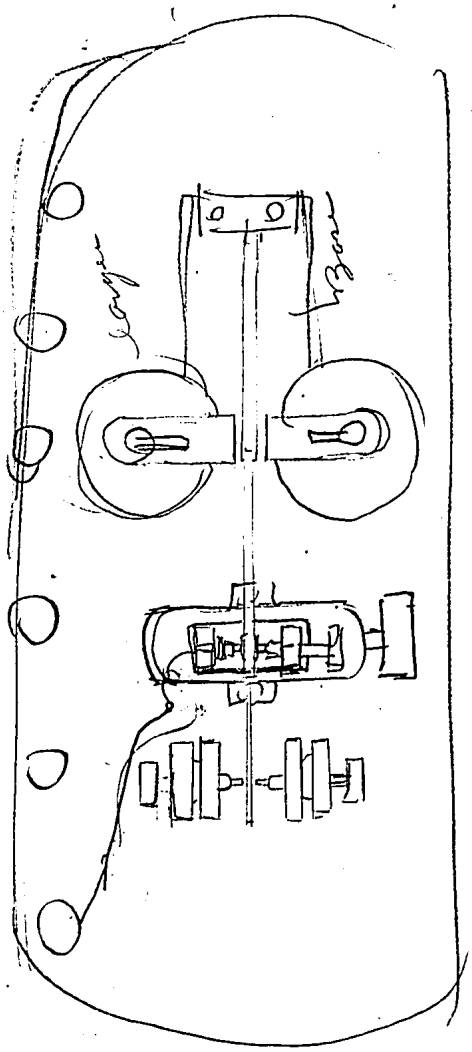


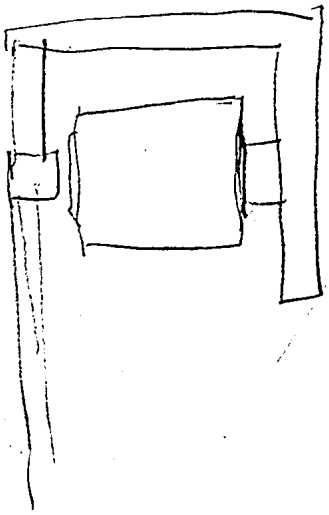
April 1885

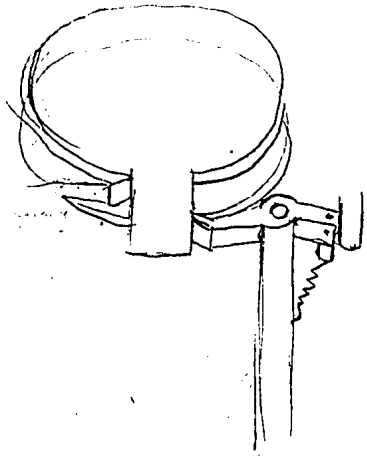
April 8th 1885



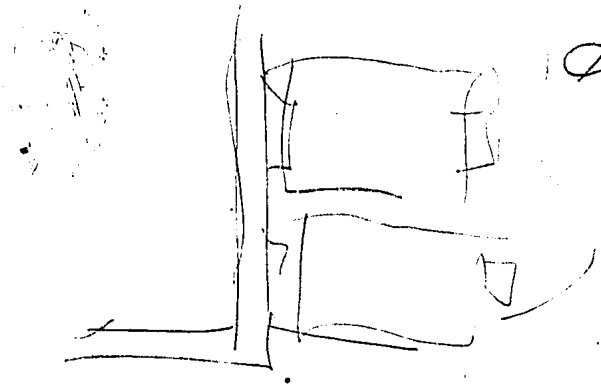


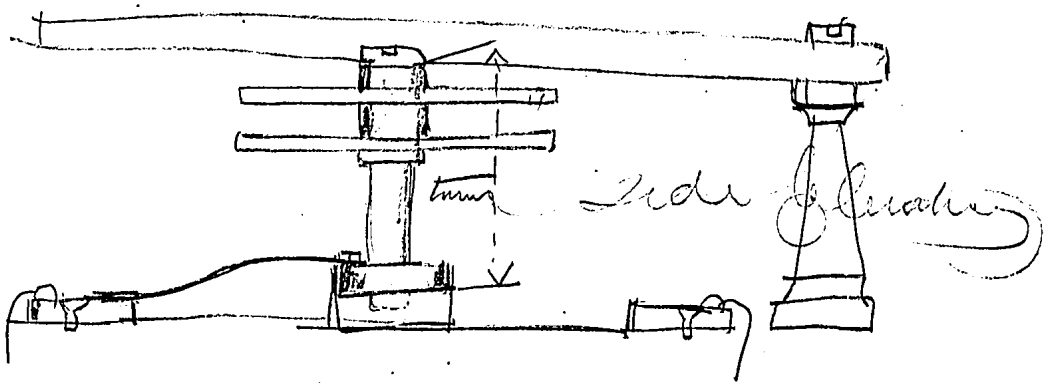


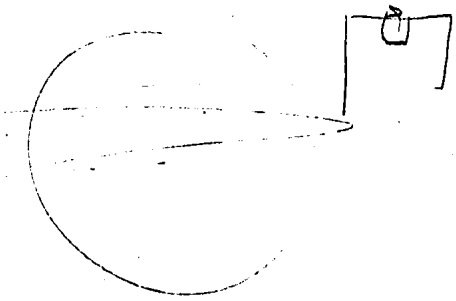


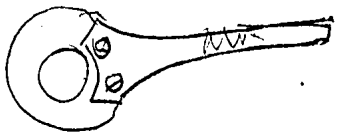


April 1885









THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

Form L. 1900-2-18-'86.

New York, 188

Dyer —

Have I a patent on an ordinary governor (Steam Eng) made to lift a lever up & down according to the speed which lever simultaneously raises or depresses several levers or springs provided with contact points all in series so the current is broken in several places simultaneously to prevent spark and these points put right in a main circuit the governor being run by a motor for regulating the motor speed by cutting off the entire current at intervals if not I know I have it in some regulators but have I used it to regulate motors. if not a good claim can be obtained prepare a patent.

Down at Menlo a long time ago we made dies & we drew tubes etc through round dies to make even cylindrical fibres we made only a few lamps — I now want to take the subject up again — Can I apply for a patent and get claims for a cutting die — not a drawing die but one that cuts so that fibres or woody matter

See description in notes of patent room file case

THOMAS A. EDISON,
No. 65 FIFTH AVENUE

New York,

188

Apr 11 86

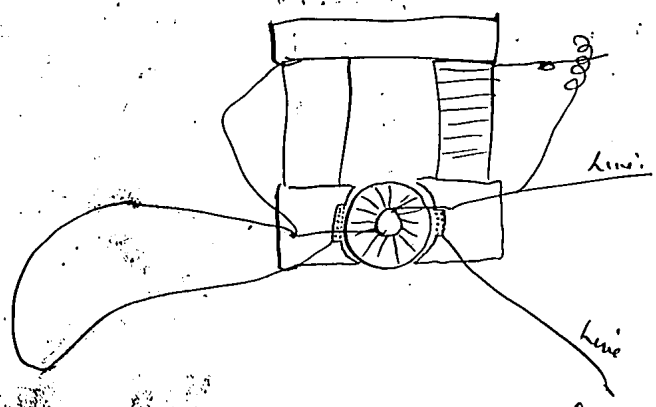
Form L. 1900-2-18-'86.

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

New York, ... 188

(2)

Can be cut to shape — whether the dies are split or solid (10) holes —



Patent this — part of the face of the field to be cut away and large wire wound parallel with the armature wire + with a carrying capacity equal to the armature and so arranged as to resistance current and turns of wire that its magnetizing effect on the armature is equal to the wire on the armature,

The current from the armature is passed through this fixed coil in such a direction that it magnetizes the armature just the opposite to the magnetization due to the wire on the armature - this causes the armature to have no magnetic

NEW YORK, 188

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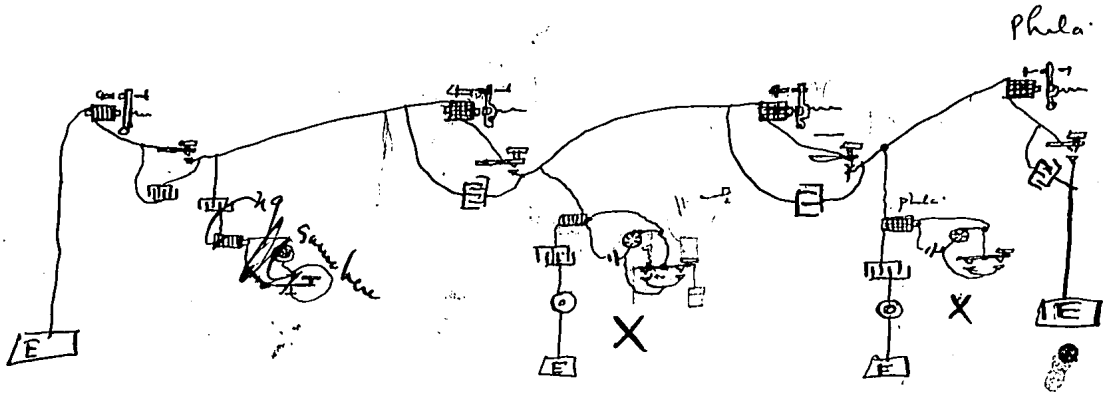
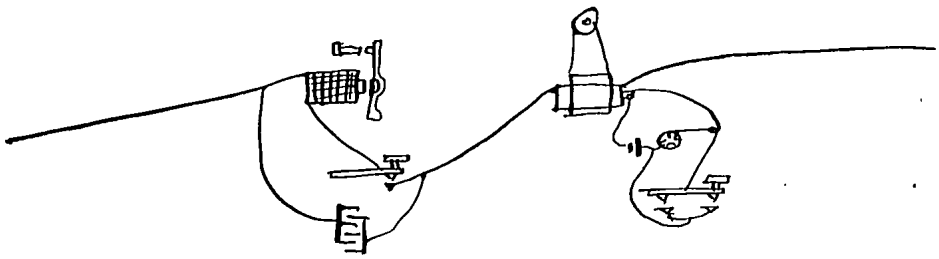


one X at Each station,

at Terminals only Condenser round Key
at all intermediate stations Condensers around
Key & Relay —

Type No 1

NEW YORK, 188



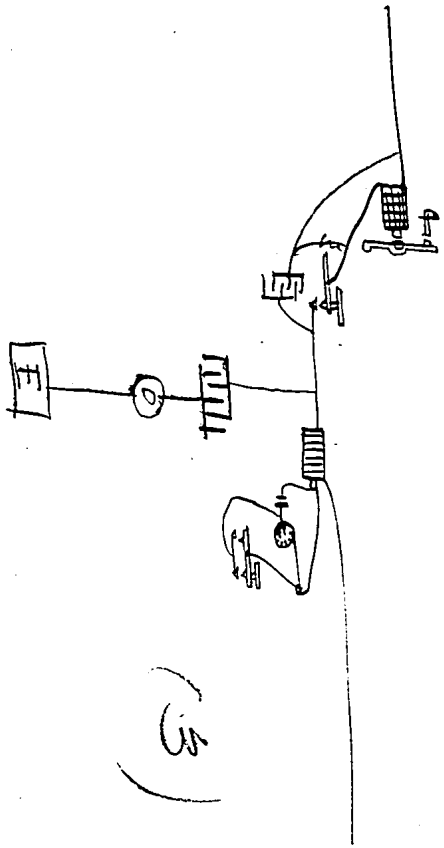
THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

April 27th, 1885.

April 27th, 1885

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

NEW YORK, _____ 188



Type X

(3)

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No. 65 FIFTH AVENUE.

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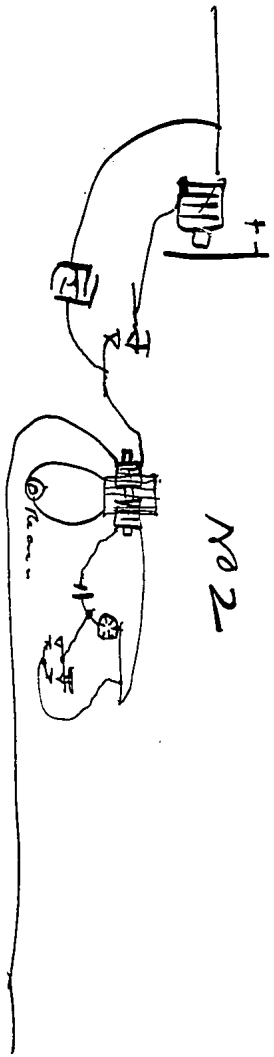
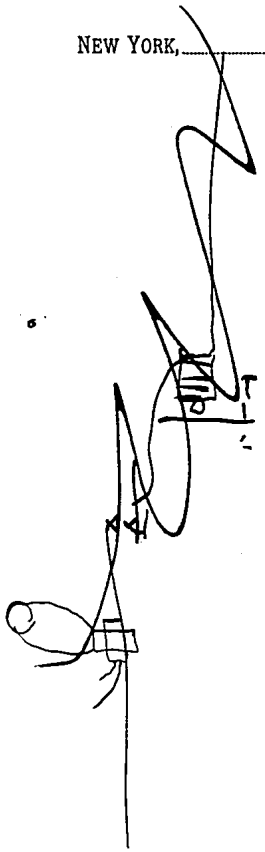
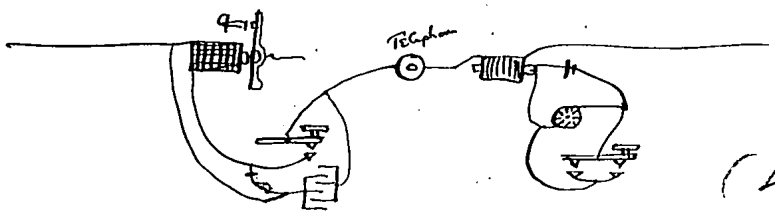


No 2



NEW YORK, _____ 188

Type 2



(4)

Condenser may be omitted in one only — other way preferred —

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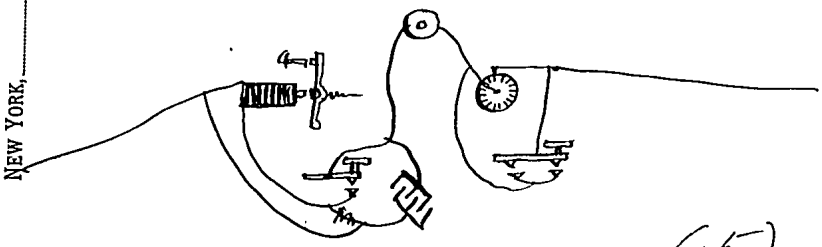
NEW YORK, _____ 188

Type 3



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THOMAS A. EDISON,
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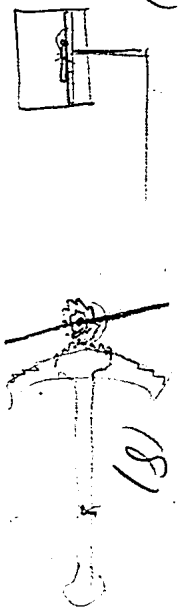

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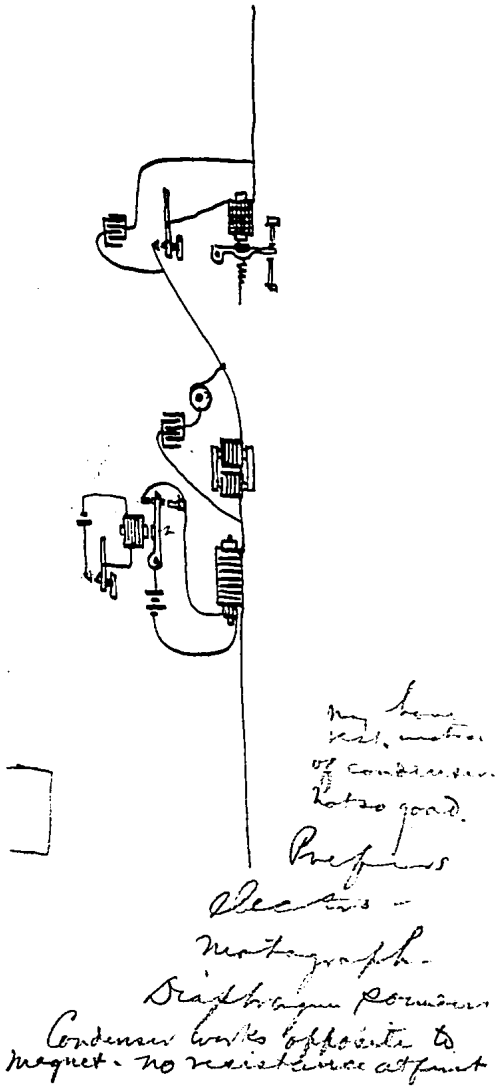
(8)



THOMAS A. EDISON,
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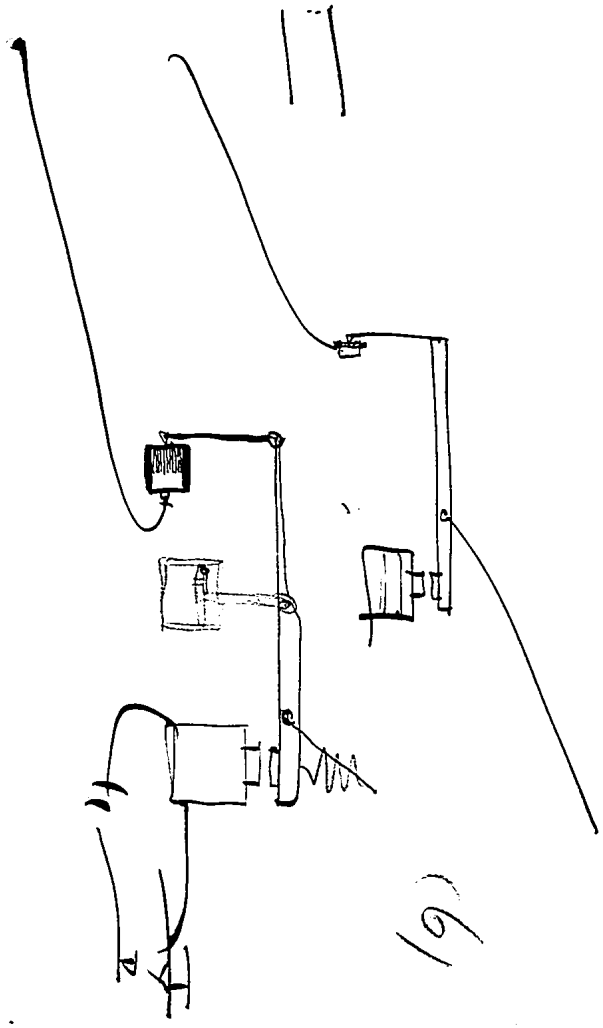

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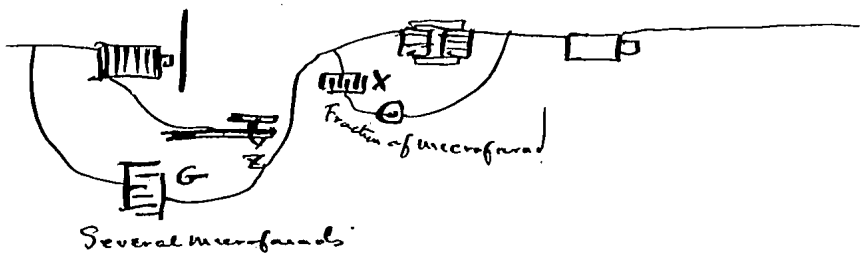
THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

NEW YORK, 188



Dyer Here is important fact to base claim on – 'The sound on telephone is just as loud with 10/1000 of microfarad in X as with several microfarads, while the Morse writing heard on the telephone increases in loudness + disturbing factor as we increase the microfarad capacity of X Hence claim such a capacity of X as will diminish the ~~[illegible]~~ regular Morse below the disturbing point = on the other hand the disturbing power of G is increased regular Morse is diminished if capacity of condenser

Edison

THOMAS A. EDISON,
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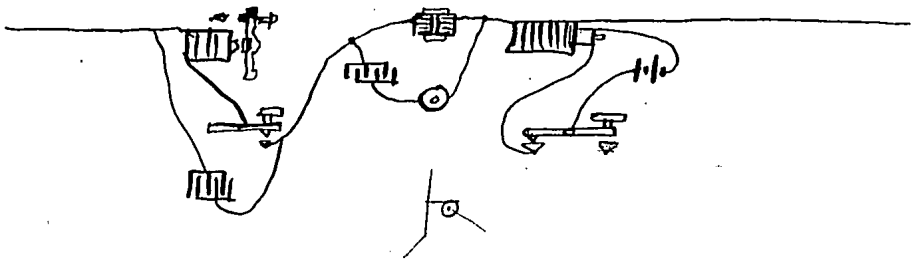
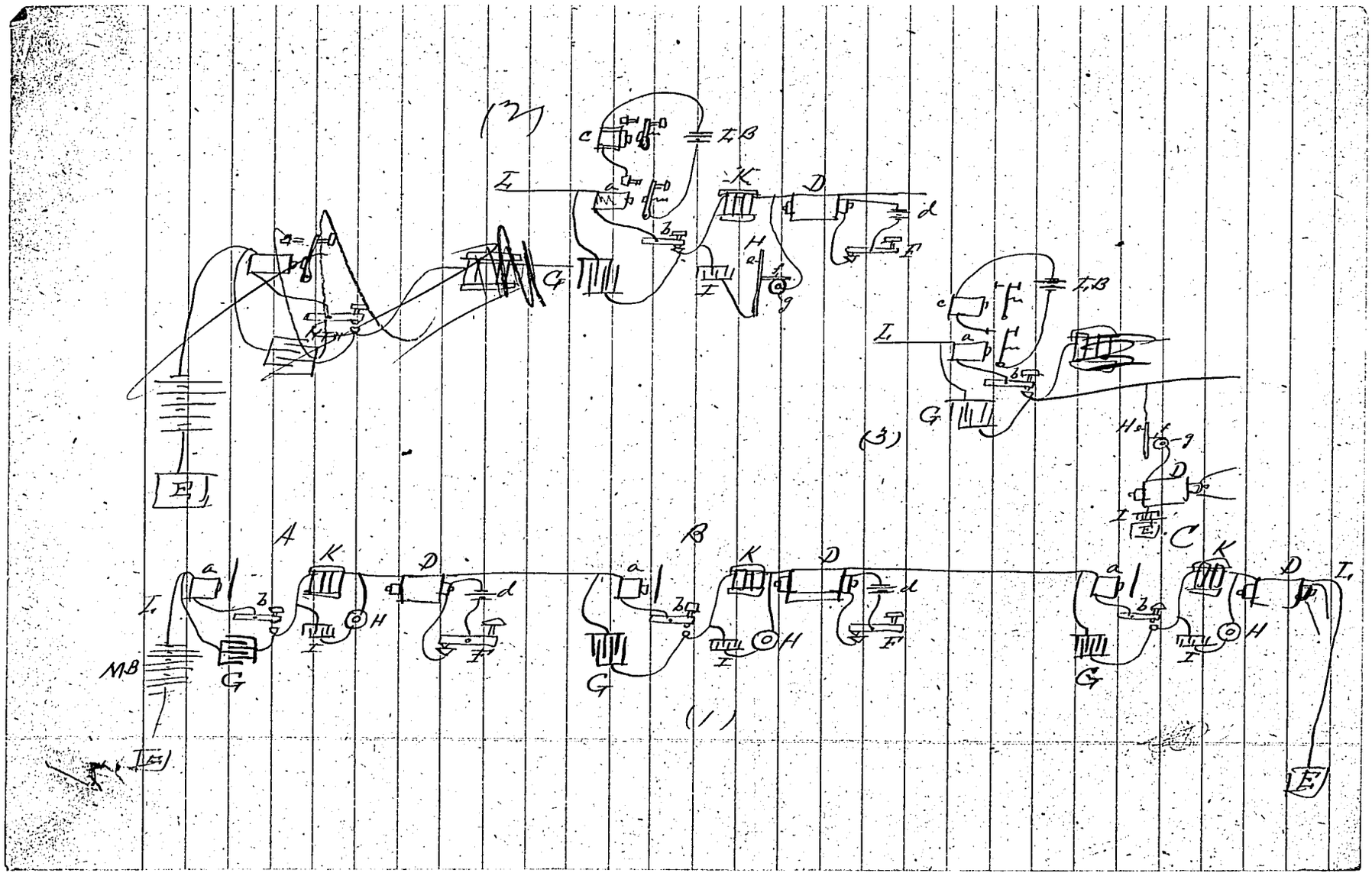
NEW YORK, 188



Dyer – I find that with Regular Key arranged the way it is as good + much simpler than with sounder closing on both back + front points. You know that when you open a primary of a coil the wave is twice as strong as on closing as the primary closed ckt absorbs the induction. Hence on depressing Key primary opens loud sound is heard in telephone (depressing) drawing the armature up strike – The door swing with momentum of clash part + sounder on closing Key primary closed no sound is heard in telephone


(2)
(3)
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A
B
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K
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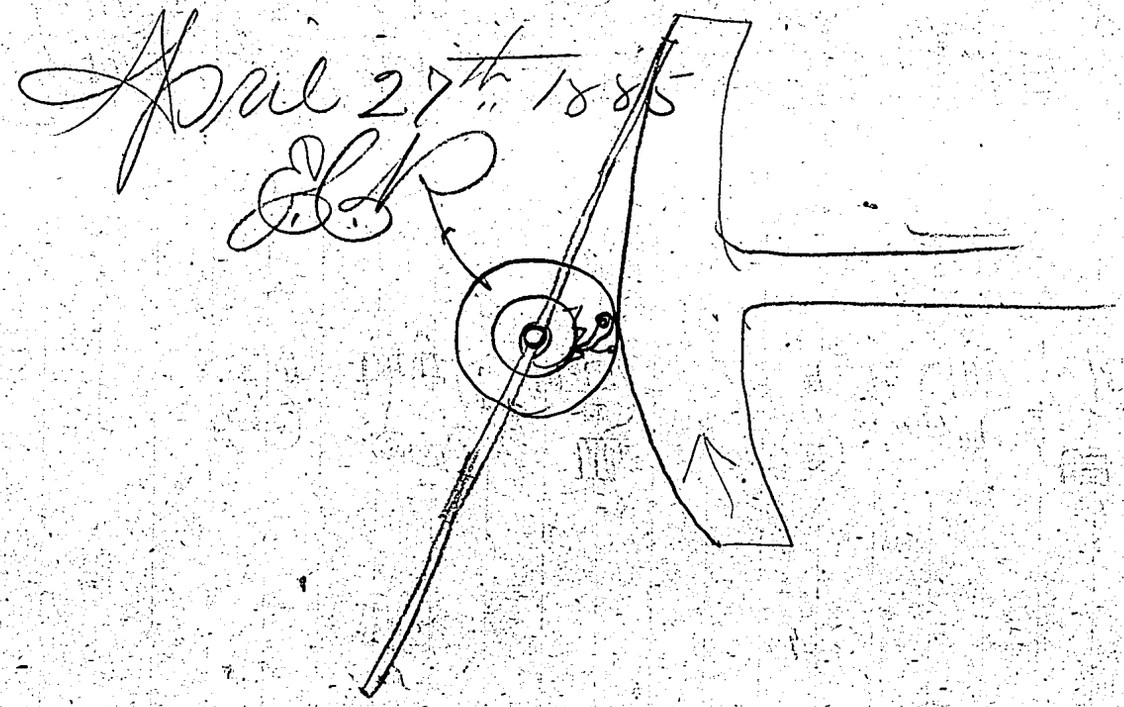
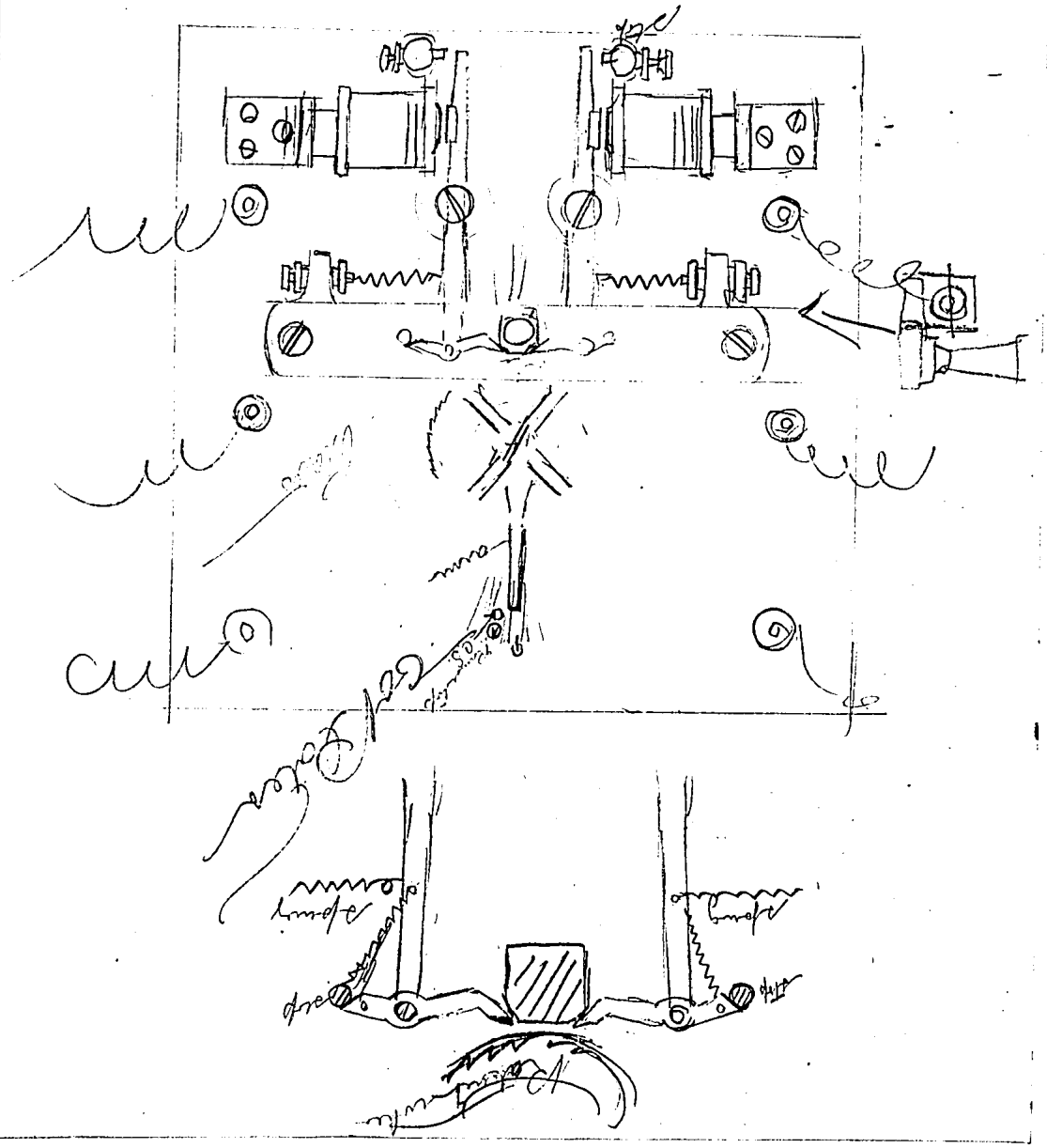
I
MB

April 27th 1885



April 1885



BERGMANN & CO.
ELECTRICAL WORKS,
Patentees and authorized Manufacturers of
EDISON ELECTRIC LIGHT FIXTURES AND APPLIANCES,
COMBINATION (Electric Light and Gas) FIXTURES A SPECIALTY.
DESIGNS AND ESTIMATES FURNISHED ON APPLICATION.
The Most Complete Facilities for all kinds of Electrical Work.
292, 294, 296 AND 298 AVENUE B,

New York April 29 1885

Dick -

I send you diagram for another patent its on the lines of the Quadruplex; one message is sent by reversing the Current the other by increasing and decreasing Current. To use this principle on way wire I struck a cute thing = Say ~~I have~~ no reverse men are working a Keys X X all along the line are open I have no Battery from this apparatus = on the line there is Constantly Connected say 16 cells M. 1/2 of these may be at one Terminal & 1/2 at other or all together anywhere in line, this Current is used to signal on common relay by increase & decrease by means of Key & Resistance The Battery S S' is exactly twice as many cells as M but always thrown to line in the opposite direction to M hence of the 32 cells 16 neutralize the 16 of the main Battery put 16 on line but in opposite direction thus giving a reversal & working polarized relay but not effecting the Common relay as there is always the same ~~amount~~ amount of Current = You know that in the Quad so in all cases the Common relay at the moment of reversal loses its magnetism

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New York, 188

(2)

for an instant and this causes the relay lever to leave its front point for an instant thus multiplying signal ~~[illegible]~~ it is very quick but still it multiplies to obviate this in the Quadruplex The back point is used to close the Sounder hence at the moment of reversal the lever jumps back nearly striking the back point & does frequently strike & give a false sound. To reduce this defect to the minimum I have struck very good thing I place a large magnet n in connection with the regular magnet & shunt the latter with it & put placing a condenser of large capacity in circuit with it The Resistance of this magnet is 2 or 3000 ohms or more while the regular magnet is only ordinary Relay resistance 150 ohms at the moment of inversal a powerful waves due to the discharge & recharge of the condenser takes place and this wave has its greatest power at the Exact moment the ordinary magnet has no magnetism this wave charges the big mag n & holds it for

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New York, 188

3

an instant. this wave is momentary. thus you see at the moment when the regular magnet has no magnetism it has which ceases when the common magnet has —

Claim this =
also number of stations on one line.
provided with common & polarized —

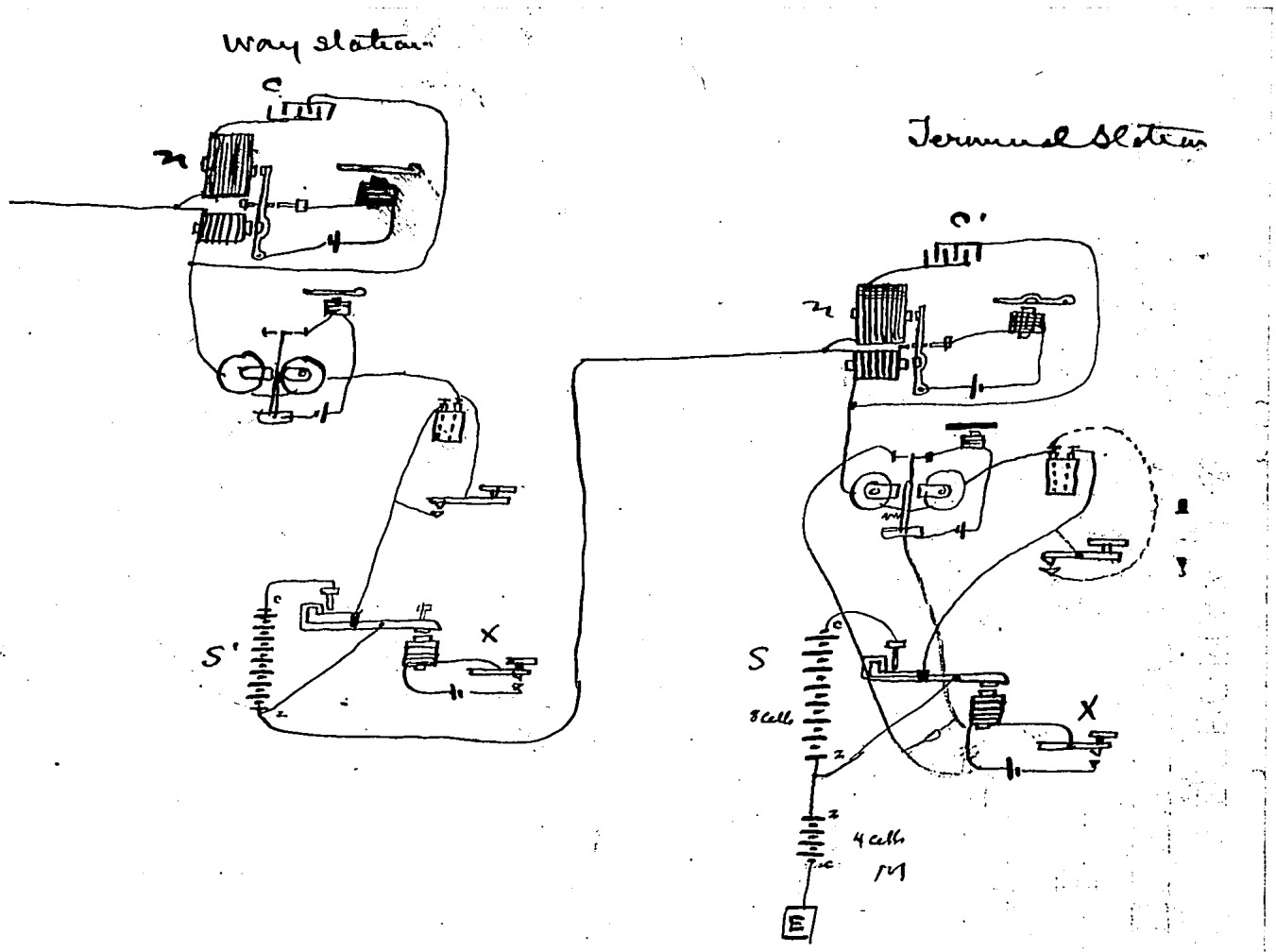
Combs throwing in out Res to work common

The manner of removing the due other of the Current on line at a number of stations

This method of removing for use in telegraphy.

This way station system is entirely original & you ought get some very broad claims —

The only defect is that while the Common relay opens can interrupt the polarized mean must only close or interrupt while the sender is open this is no objection as they can hesitate every 10 words or so — Edison


Way station
Terminal Station
C
n
C'
n
S'
X
S
8 cells
X
4 cells
E

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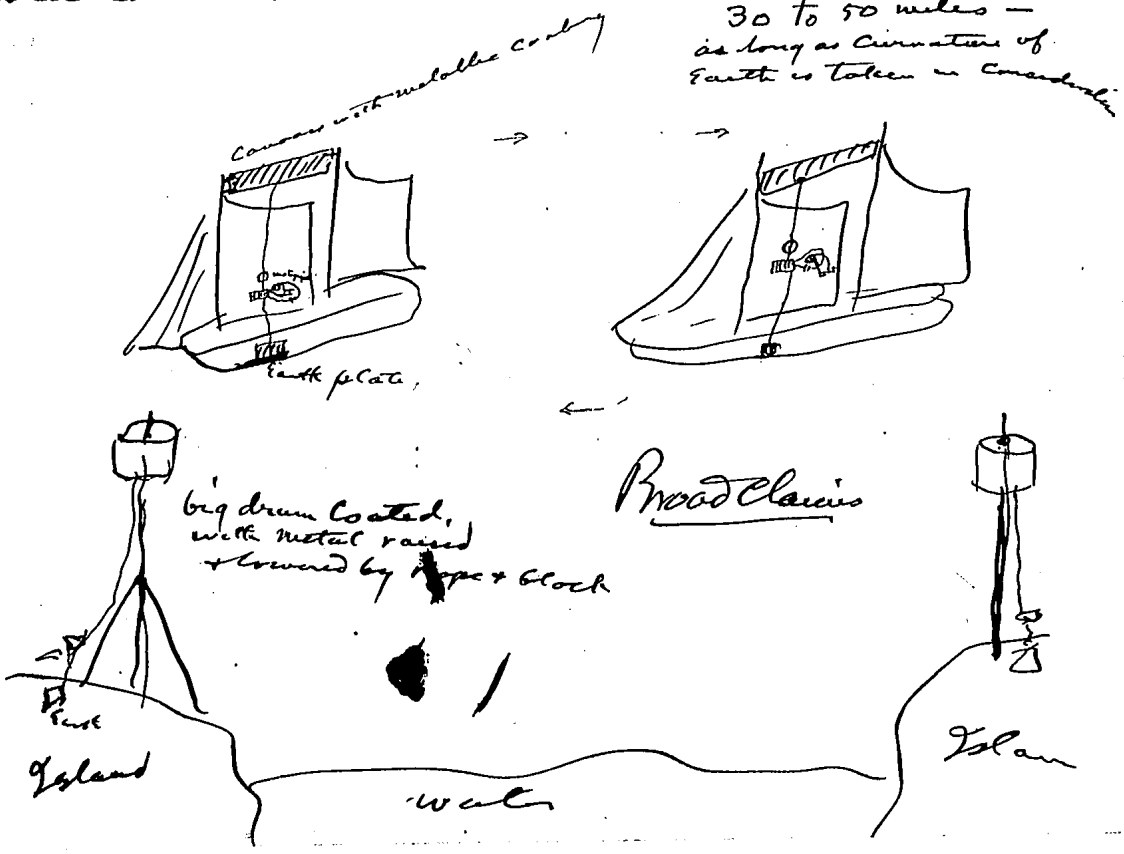
292, 294, 296 AND 298 AVENUE B,

New York, May 6 1884 For 188

Dyer -

Take out patent for new method Telegraphing without wires especially available for communicating between Ships at sea across Rivers from Island to Island.



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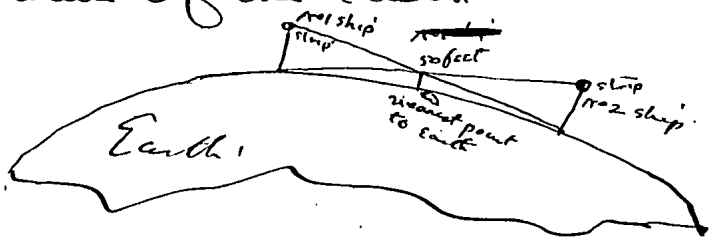
You can telegh from ships 24 miles apart when metallized strip is 100 feet from sea level & then be 50 feet over the line of Curvature of the Earth



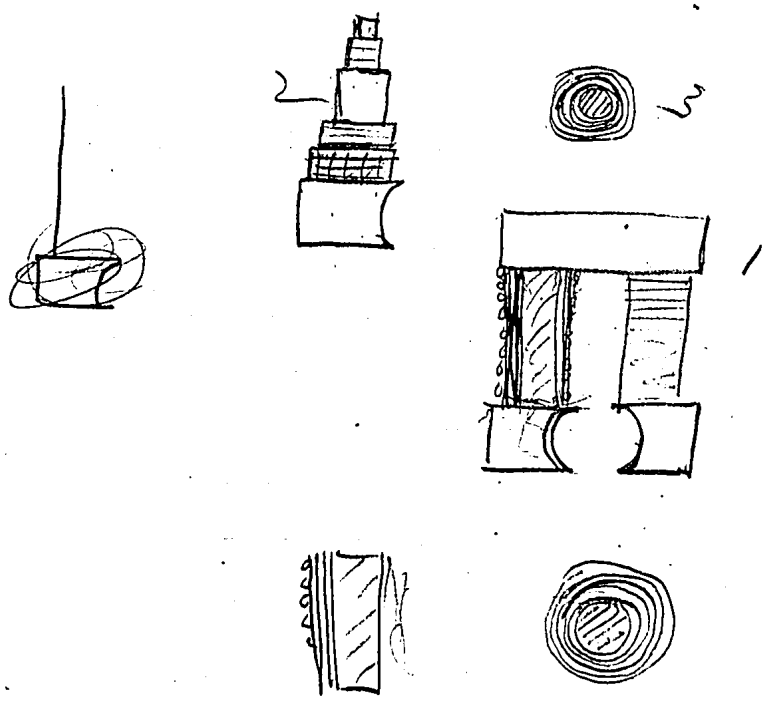
Spose two ships were 24 miles apart they could telegh & if there was another ship 24 miles further the messages could be repeated from the 1st to last ship 48 miles apart & so on if on the lines between Liverpool & New York Communications could be exchanged & repeated from ship to ship 1/2 way across ocean — at sea its very quiet & one only has to contend with the absorption due to the sea, & not to trees houses, hills etc.

E

Damages made
12 Ft. 6 in.
May 1885

54

Last of Mary made
Circuit of Ft. Wm. Grapp
in railroad case
Wm. Gunnery v. Maine



Drawing made
May 11th 1955

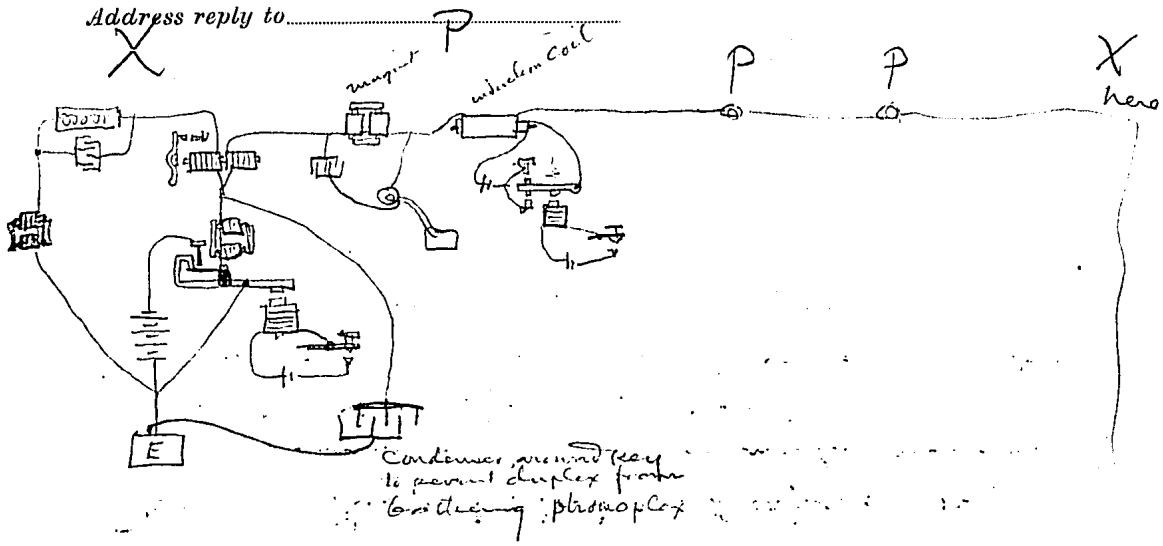
Form M.

THOMAS A. EDISON,
Central Station, Construction Dep't,
No. 65 FIFTH AVENUE,
NEW YORK.

W. D. RICH,
SUP'T OF CONSTRUCTION.

..... 188

Address reply to ..... P .....

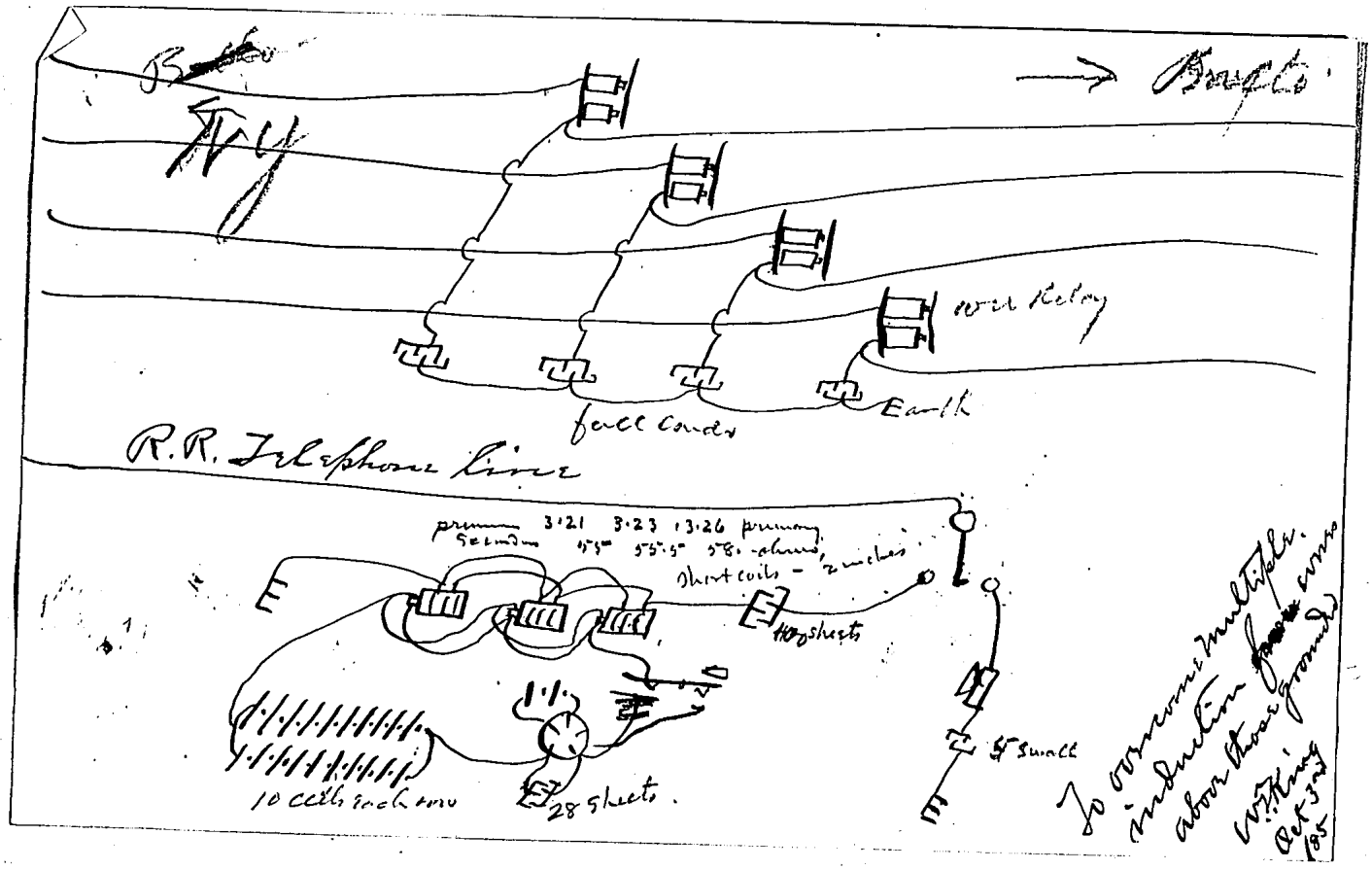


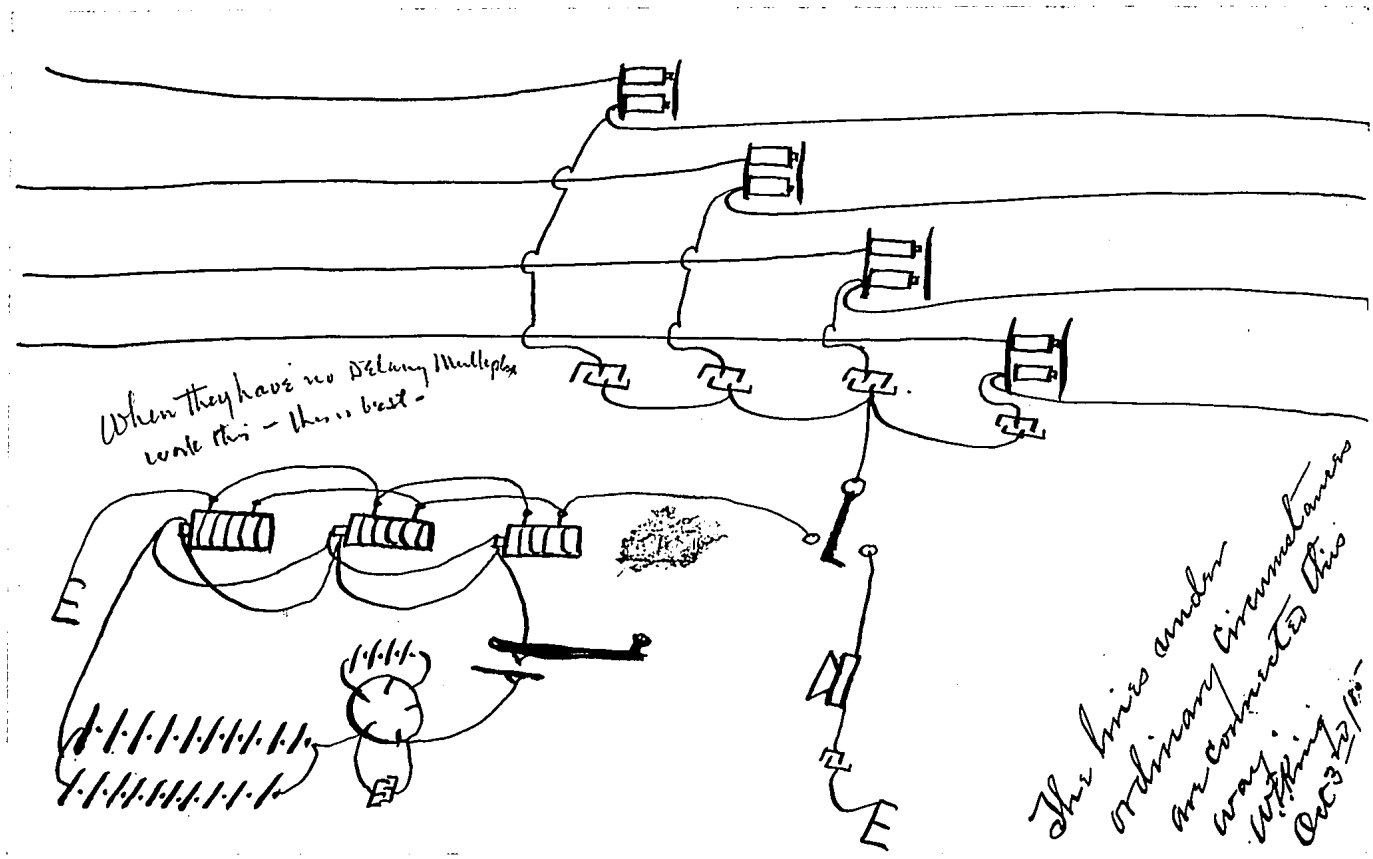
Dyer - This is to take a Duplex wire and at intermediate + terminals add several phonoplex apparatus so we can make a way wire out of a Duplex patent this in US + England

E

Germany. France —

Sep 18th 1885
EDR


Relay
Earth
R.R. Telephone line
primary
secondary
3·21
3·23
3·26
primary
Short coils - 2 inches
10 sheets
10 cells each one
28 sheets.
5 small
To overcome multiple induction from other wires
W. King
Oct 3rd
1905

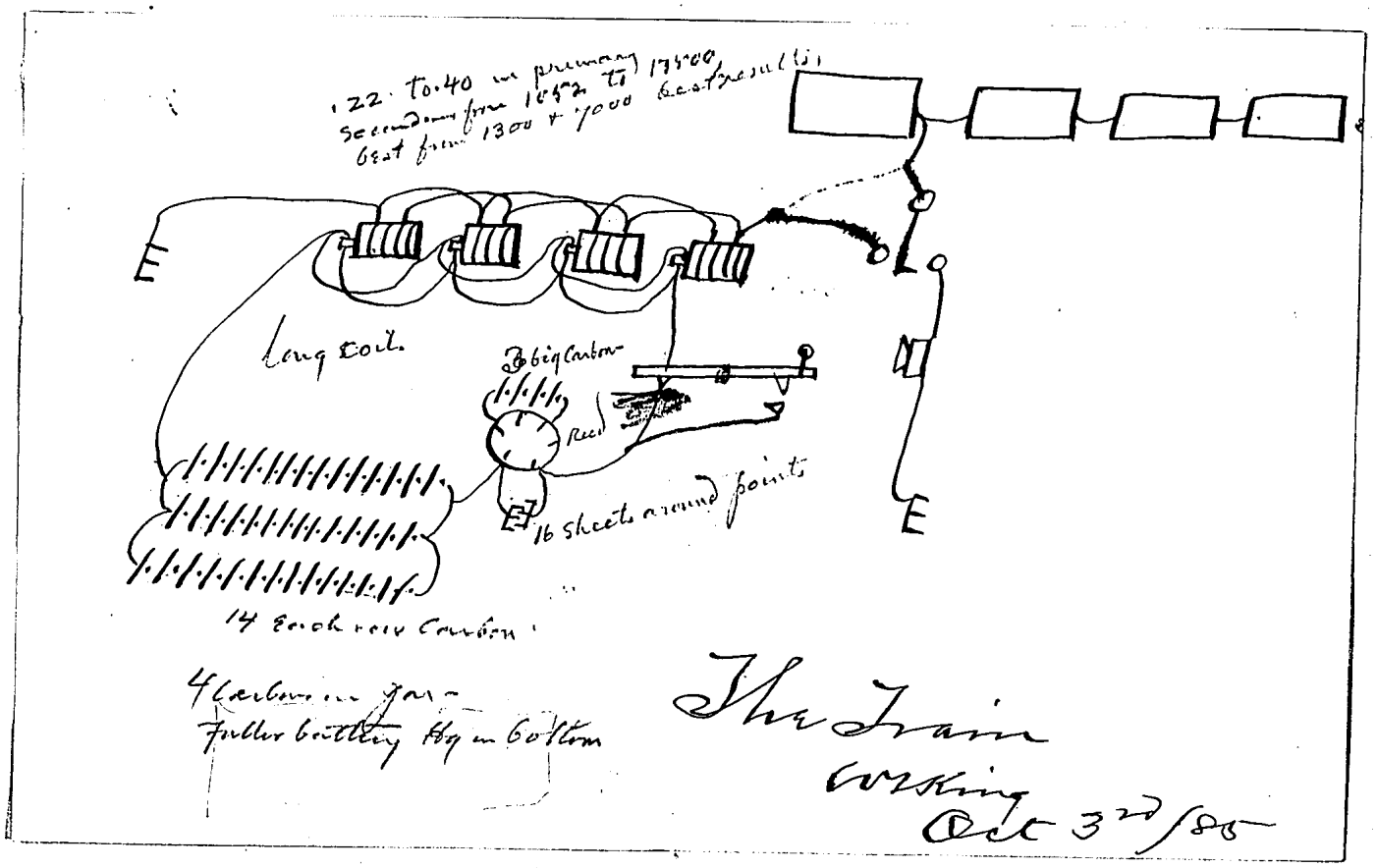

When they have no Delany Multiplex use this - this is best -
E
E
This lines under ordinary circumstances are connected this way.
W. Phillips
Oct 3 1900

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

NEW YORK, 188

I am absolutely
carried away
E.T.E.

Edison Electric


.22 to .40 in primary to 17500
secondary from 16500 to
Heat from 1300 to 7000 heat resist (?)
E
L
long coil
3 big Carbon
Rod
16 sheets around points
E
14 Each rear Carbon
4 Carbon in jar
Fuller battery Hg in bottom
The Train
working
Oct 3rd 88

Form J. J.-500-12-3-'83

THOMAS A. EDISON.
No. 65 FIFTH AVENUE.

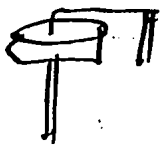
W. D. RICH,
SUPT. OF CONSTRUCTION.

Address reply to.....

.....188

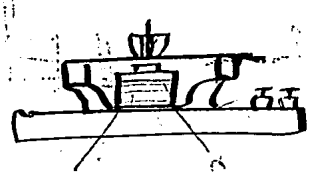
Dick —

In view of that patent



signed to coil

Change the diagram thus



per in circuit
diaphragm
+ little weight

Edison

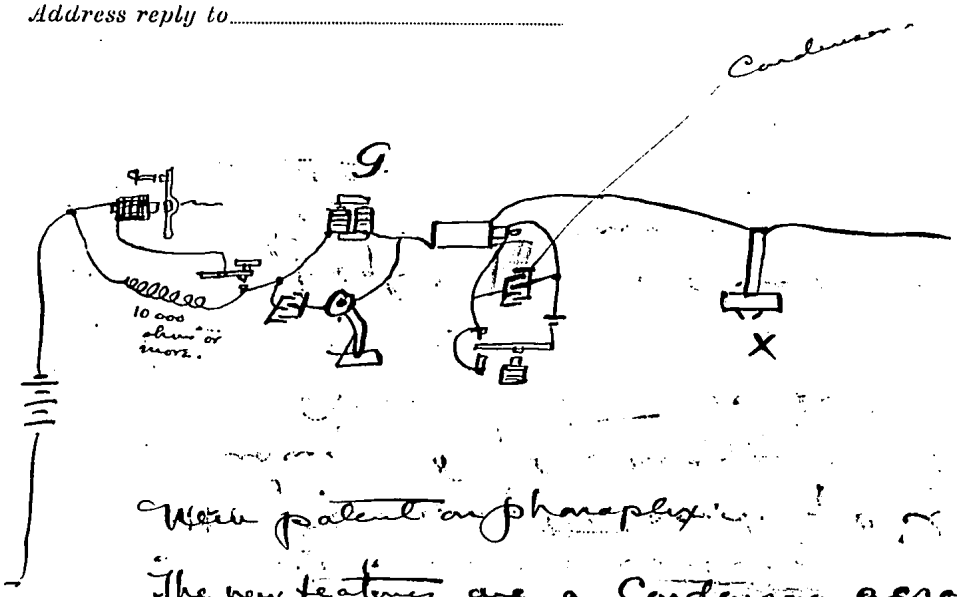
THOMAS A. EDISON,
Central Station, Construction Dep't,
No. 65 FIFTH AVENUE,
NEW YORK.

Form M.

W. D. RICH,
SUP'T OF CONSTRUCTION.

Oct 22 1883

Address reply to



Note patent on phonaplex.

The new features are a Condenser across the primary of the sending coil — 2nd using a Regular magnetic telephone X right in circuit without the magnet G —

3rd a High resistance around the Relay and Key. arranged in the way shown

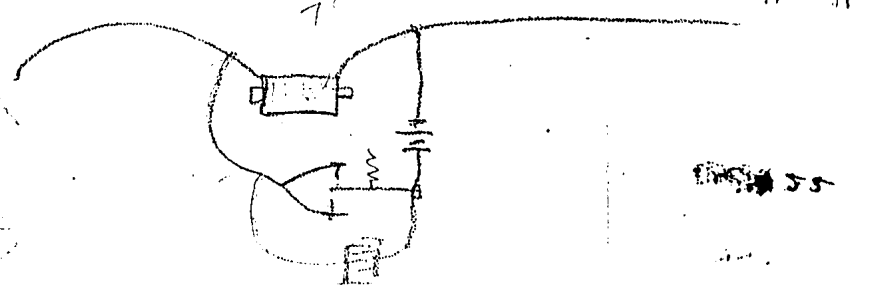
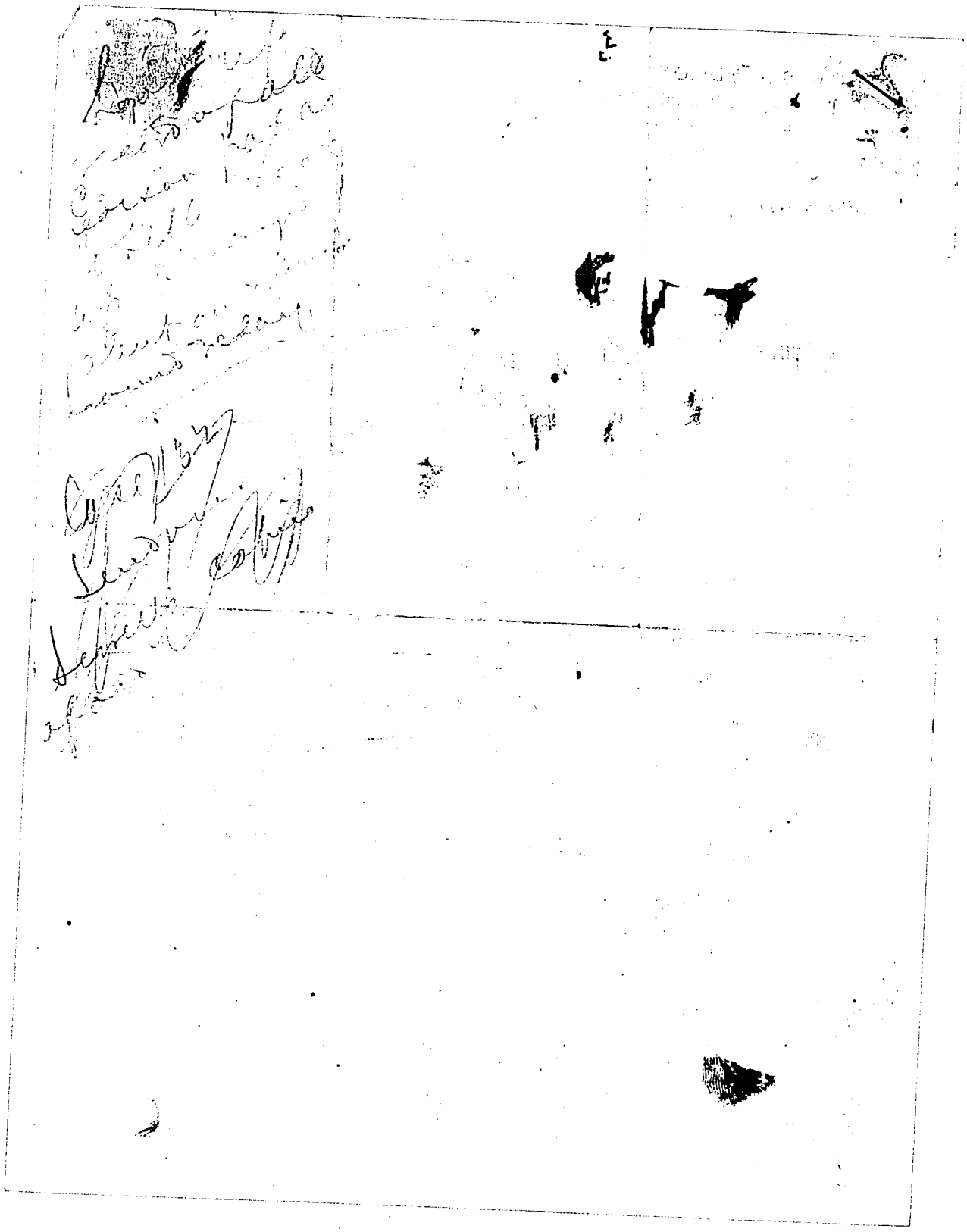


Fig. 55



THOMAS A. EDISON,
Central Station, Construction Dep't,
No. 65 FIFTH AVENUE,
NEW YORK.

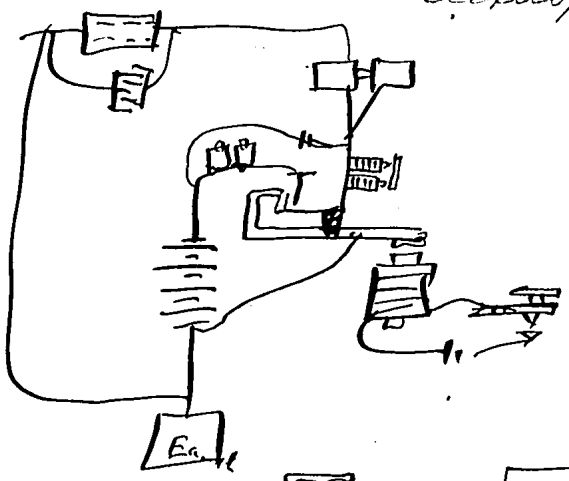
Address reply to.....

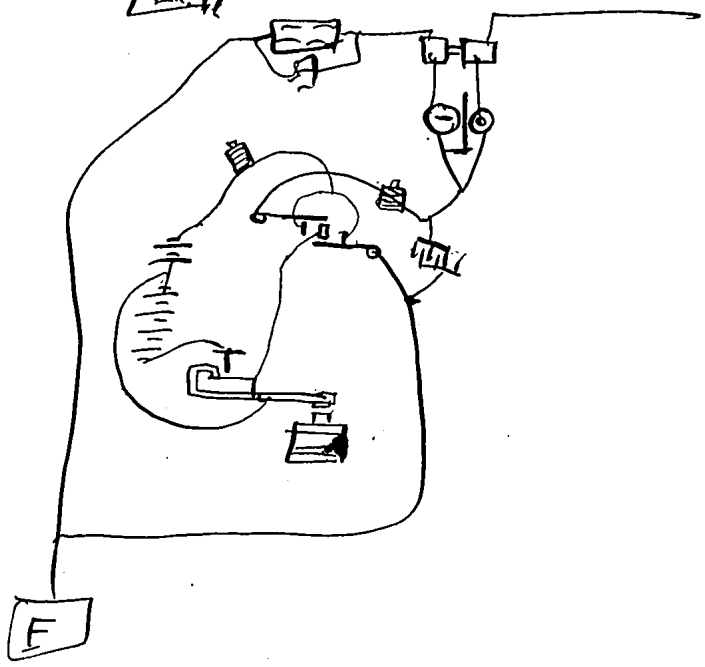
Form M.
W. D. RICH,
SUP'T OF CONSTRUCTION.

Oct 21 1885

John T. Hill
M. R. Foster

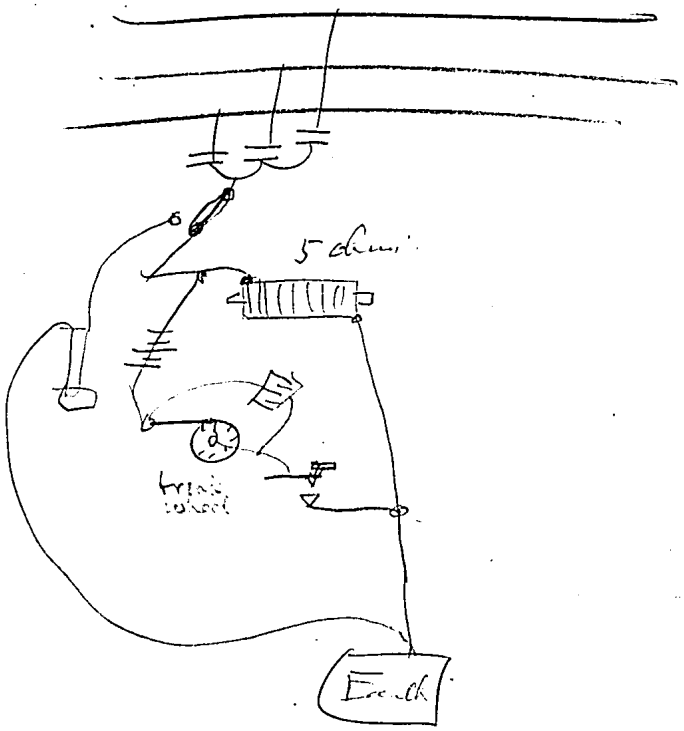
Lexdoflex

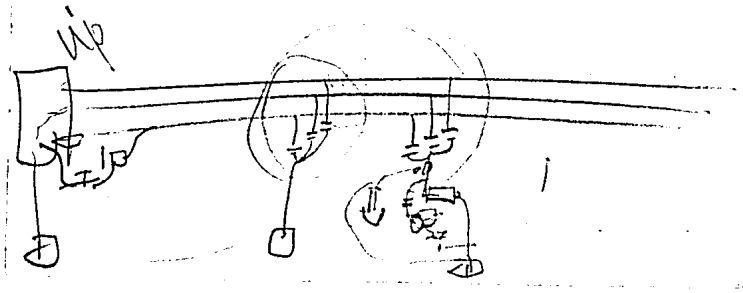




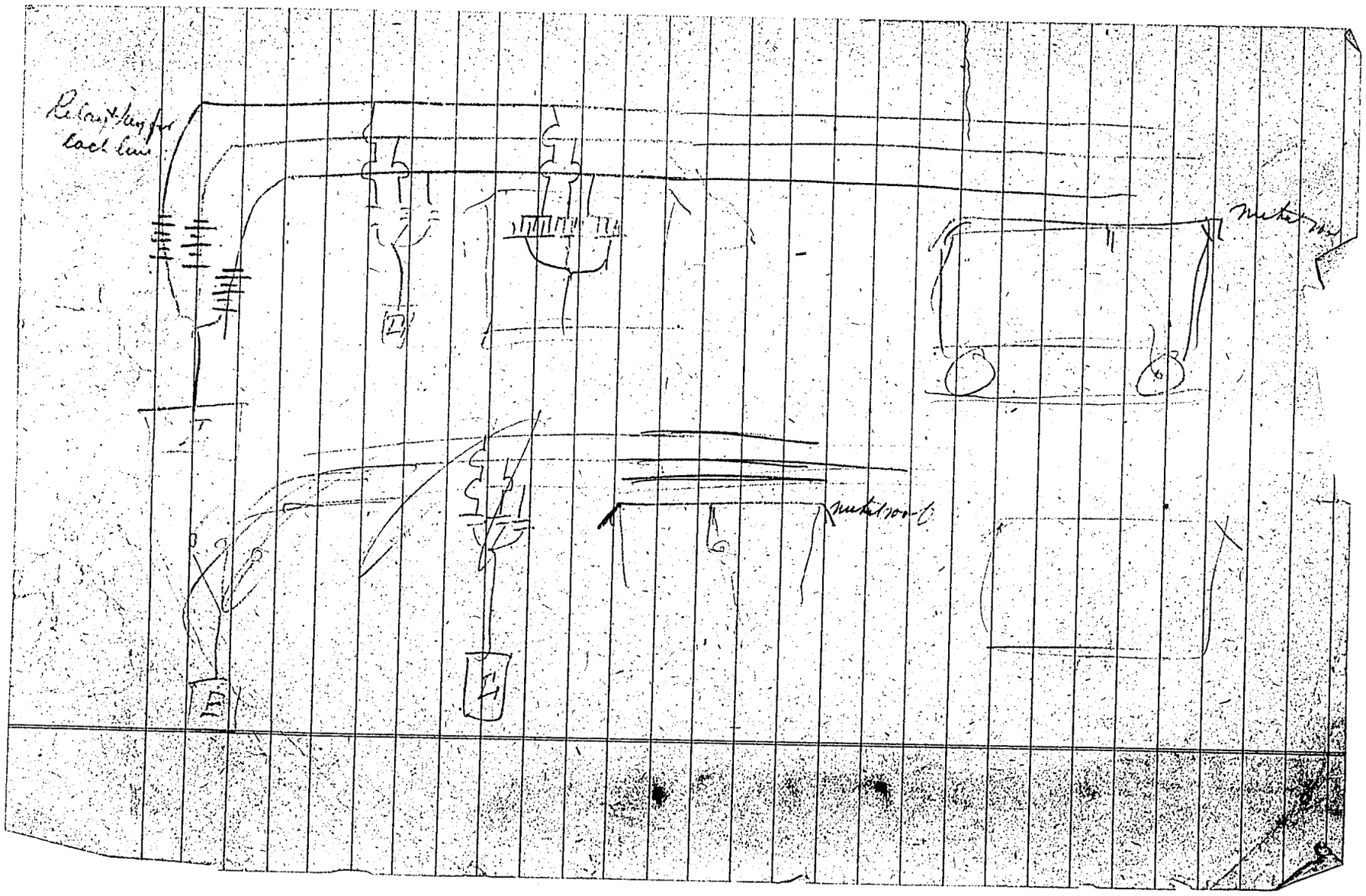
THOMAS A. EDISON,
NO. 65 FIFTH AVENUE.

NEW YORK, 188



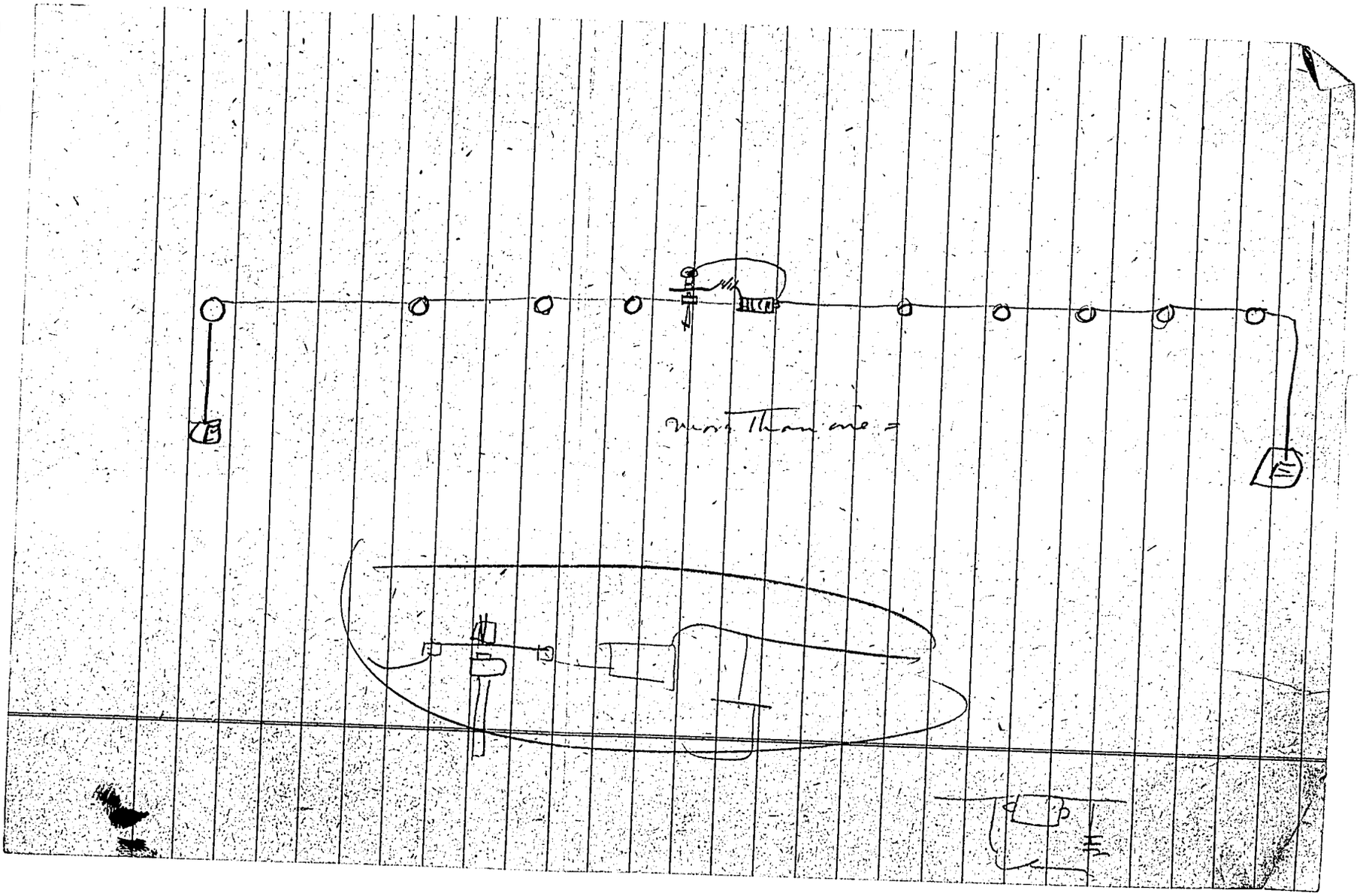


Received this
Beth Nov 1st, 1985


Relay stay for
tach line
Meter
Meter

Saw Sketch

DC 11/18/85


more than one =

E. B. Rowland
Nov 27th
1885

(5)

RICHARD N. DYER.

Cable Address:
"VERNERVE, NEW YORK."

H. W. SEELY.

DYER & SEELY,

ATTORNEYS AT LAW AND SOLICITORS OF PATENTS,

No. 65 FIFTH AVENUE,

New York, ... *188*

Sept 22nd 1875

(2)

(1)

(4)

22 سبتمبر 1985

E. T. Gilliland,
Boston.

Jany 21 1886

Dear

Take out following patent.

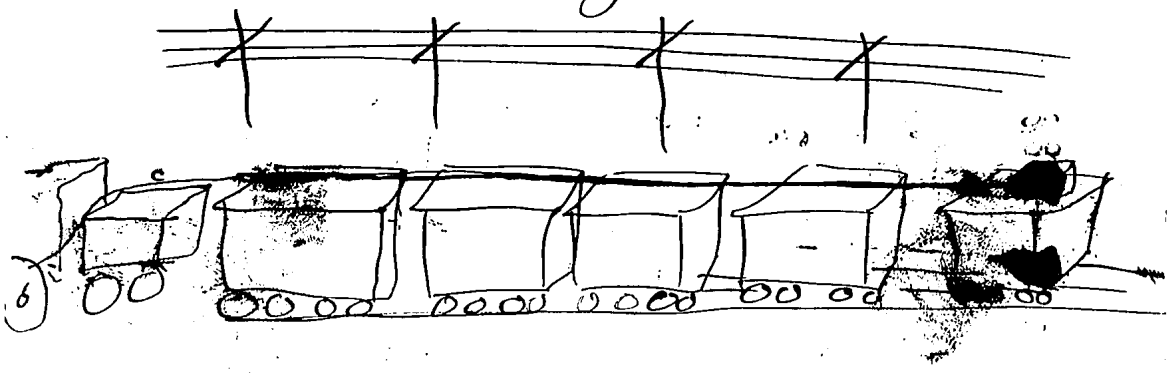
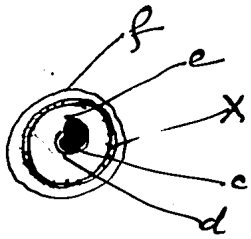


fig 2



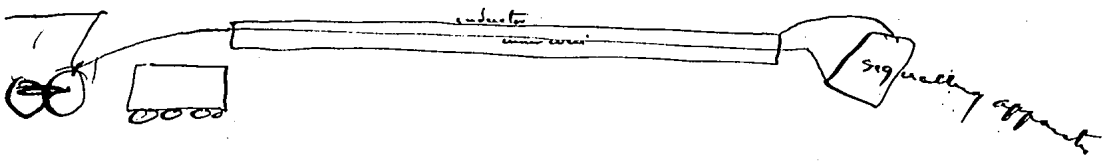
~~In the~~ Purpose I have a reel on which I coil a cord about 1/2 inch diameter the cord contains either one or two conductors. there are several hundred feet of it sufficient to reach the whole length of the longest

E. T. Gilliland,
Boston.

freight train, it is to be used as one plate of the Condenser on the RR Lehigh of which the RR Lehigh was for the other plate,

The cord shown in fig 2 consists 1st of the small wire c insulated by d - then e is rope; over this is wound spirally copper wire making a flexible cord - over this again is tape & then the whole is braided with hemp -

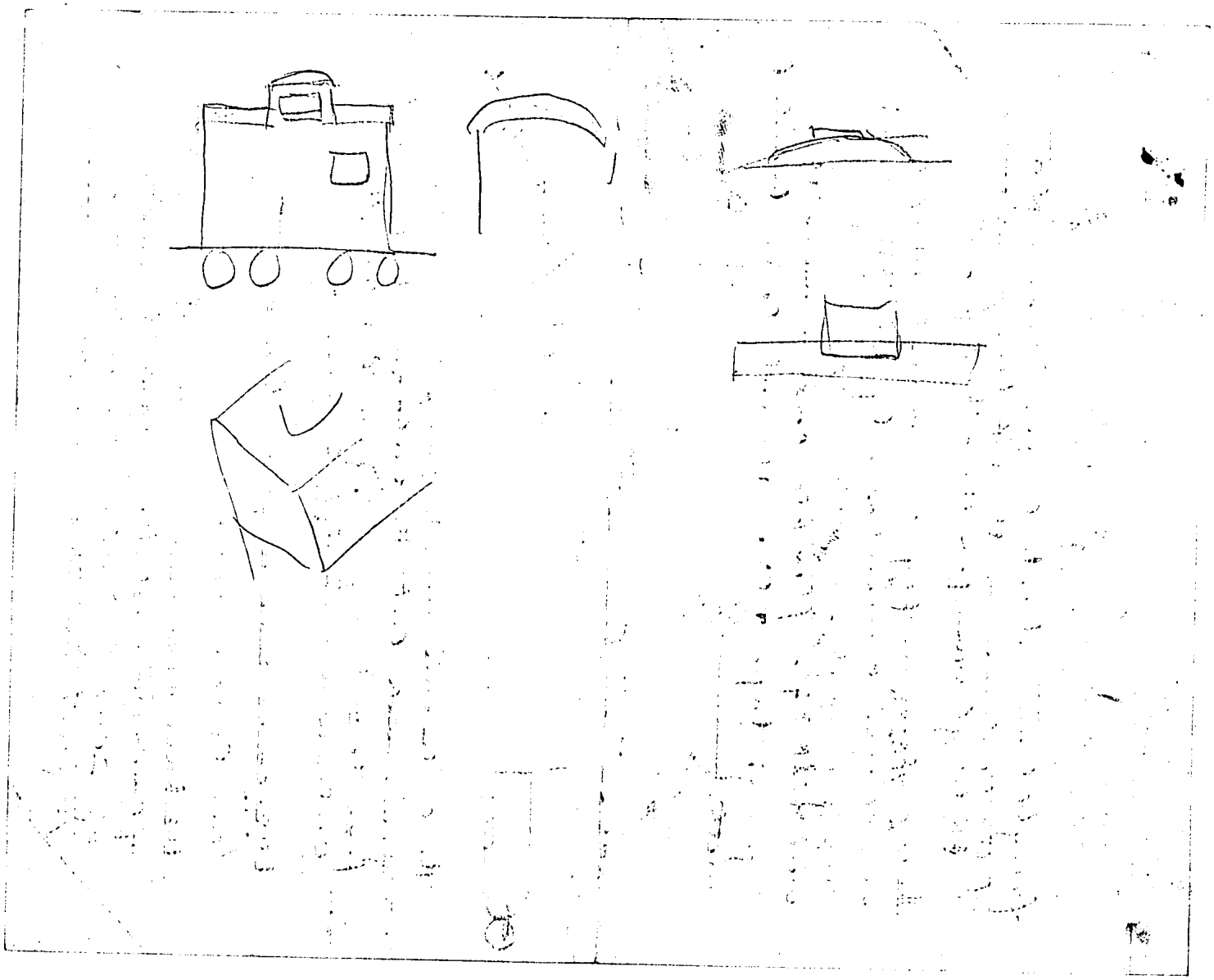
Loco



The Cutter wire runs to Locomotive to get a good ground ~~wh~~ but the Caboose wheels may be fixed to make a good ground & thus the Cutter wire need not be used -

We could use a flat band —
Lead Covered wire Etc

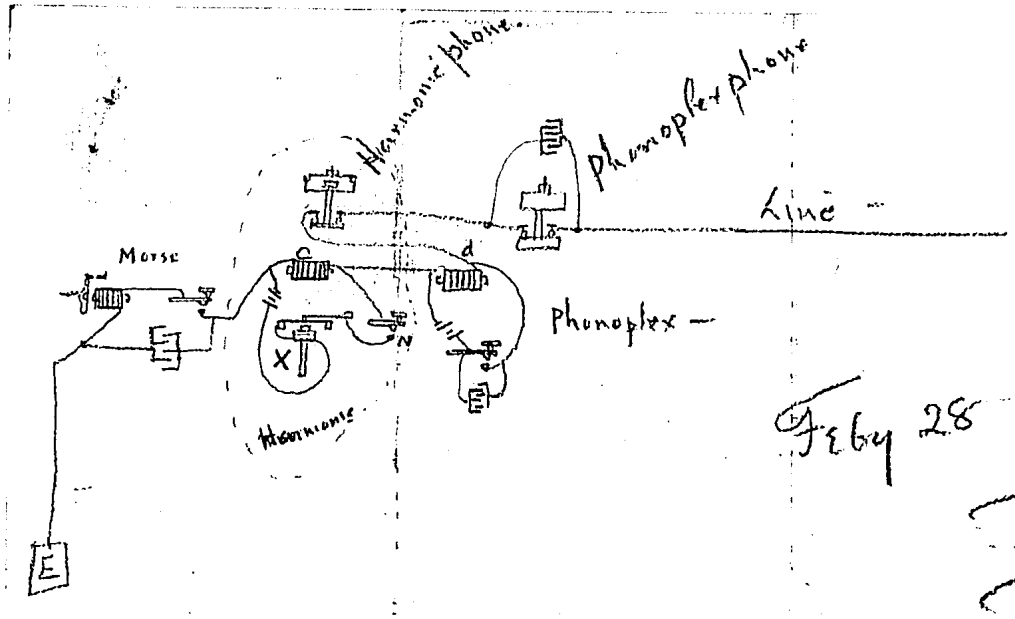
We have as ~~estimated~~ that it is length of Conductor is what is wanted ~~instead~~ of 2000 feet of suffices on ~~two~~ or 3 cars. 71-feet are 30 or 40 is better, greater



length parallell with the telegraph wires
is the ticket = we can possibly use a
~~telegraph~~ telephone instead of morse on long
freight trains I think you might mention
this,

get along claim — take patent in
my name — Edison

PS Change to RR Telp & Tel Co



Feby 28 1886

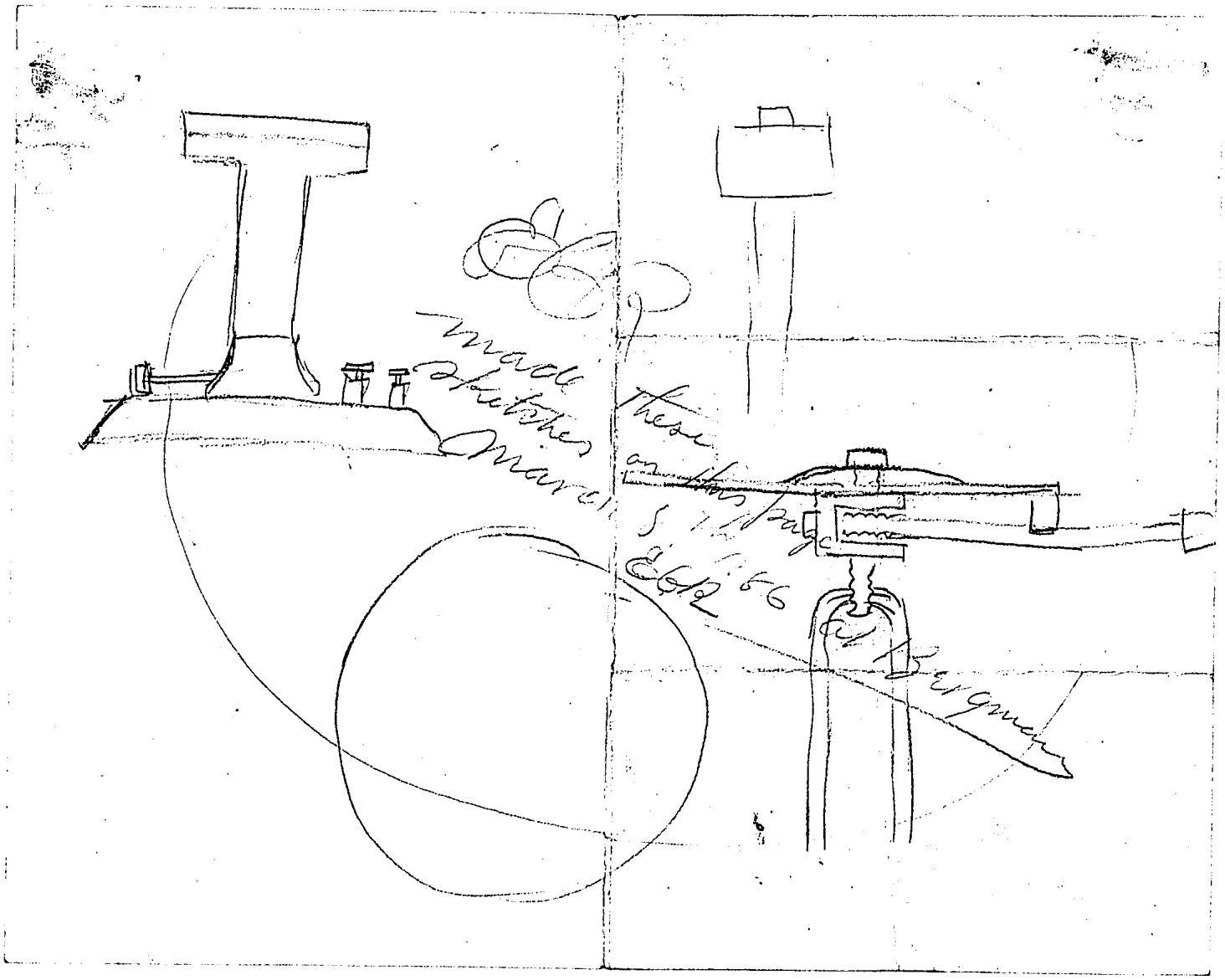
(Triphonoplex)

How that?

Dyer –

Take out patent on this. In addition to regular phonoplex I add another receiving phone just the same as the phonoplex phone except it has a light weight and has an upward limiting nut so the diaphragm cant throw it up more than $\frac{1}{1000}$ of inch – This weight responds to the rapid vibrations thrown on the wire by a local self make & break telephone diaphragm X C is a 7 ohm primary coil – when key N is closed the diaphragm vibrates and its lever self makes & breaks, thus causes the coil to send waves – The phonoplex phone is prevented from responding by being shunted with a small condenser which nearly wipes out the rapid occurring but weak vibrations of the harmonic & in addition is provided with so heavy a weight that while the strong phonoplex waves lifts it no single harmonic wave has the strength, Thus I get 3 messages over a way wire.

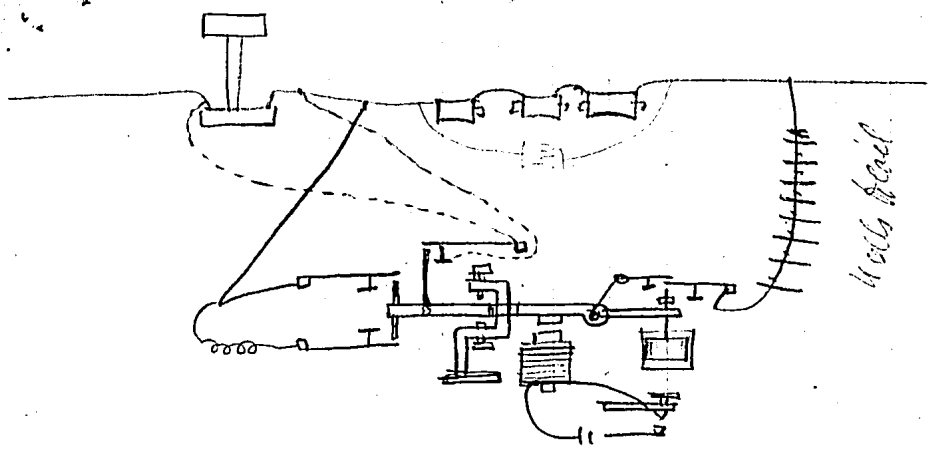
T A Edison


small sketches
these
on this page
Oct 66

June 22nd 1986

June 1986

(2)



Wells Fargo

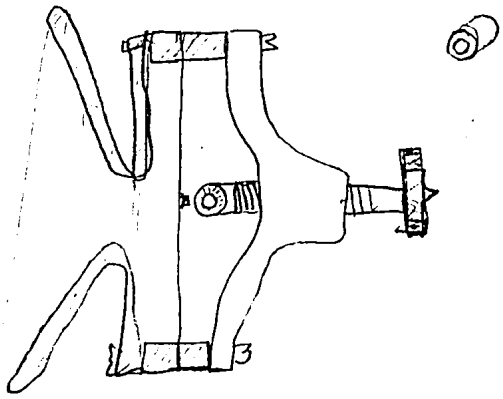
June 22/886
EGR

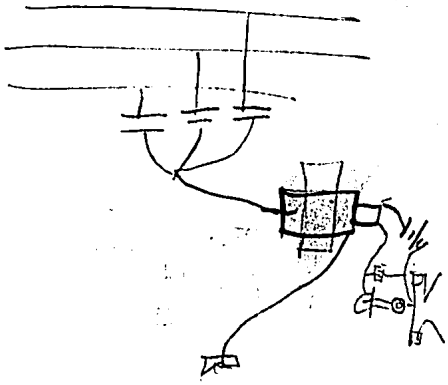
RICHARD N. DYER.
H. W. SEELY.

CABLE ADDRESS,
"VERNERVE, NEW YORK."

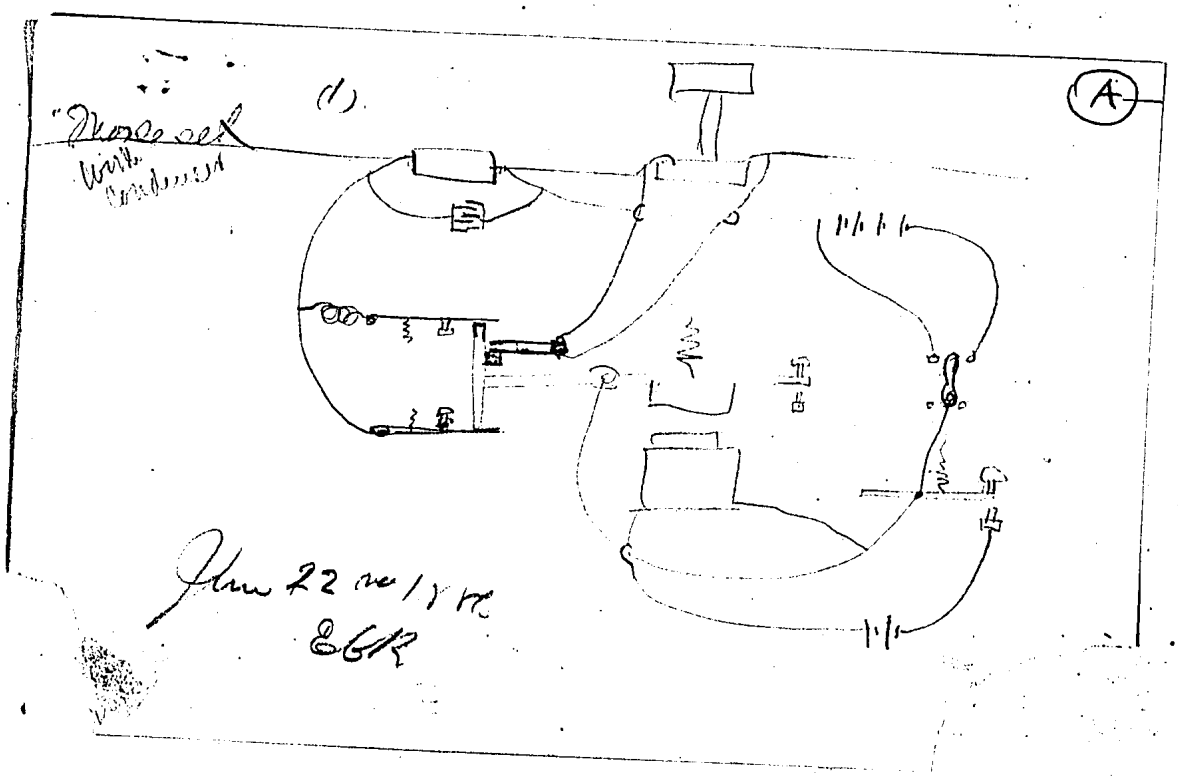
DYER & SEELY,
PATENTS,
No. 40 WALL STREET,

NEW YORK, ...188





June 22nd 1906

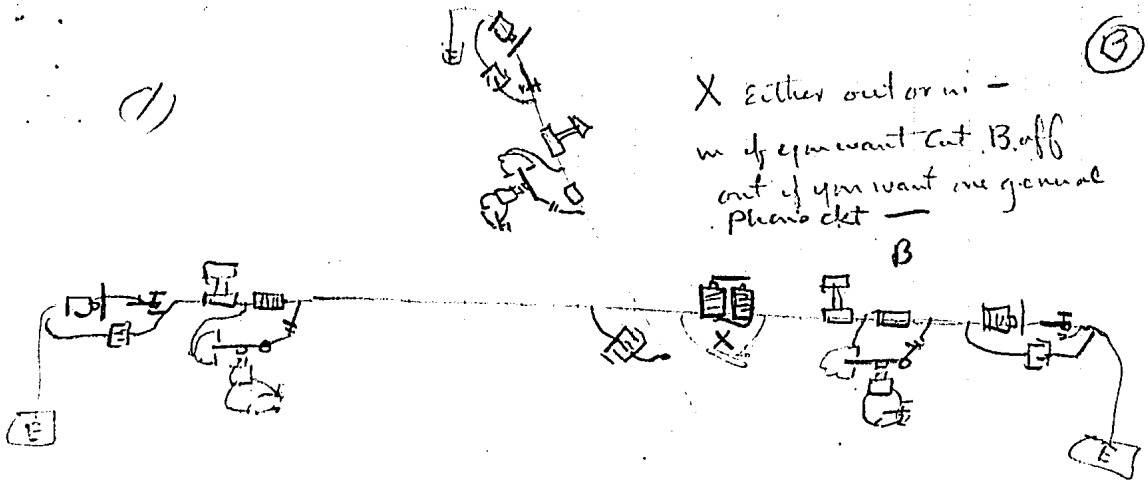

(1).
A

(1)

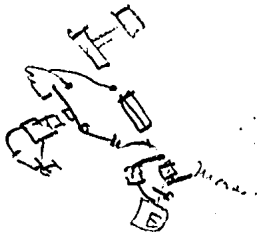
(B)

X Either out or in —
in if you want Cut B off
out if you want the general
phone ckt —

B

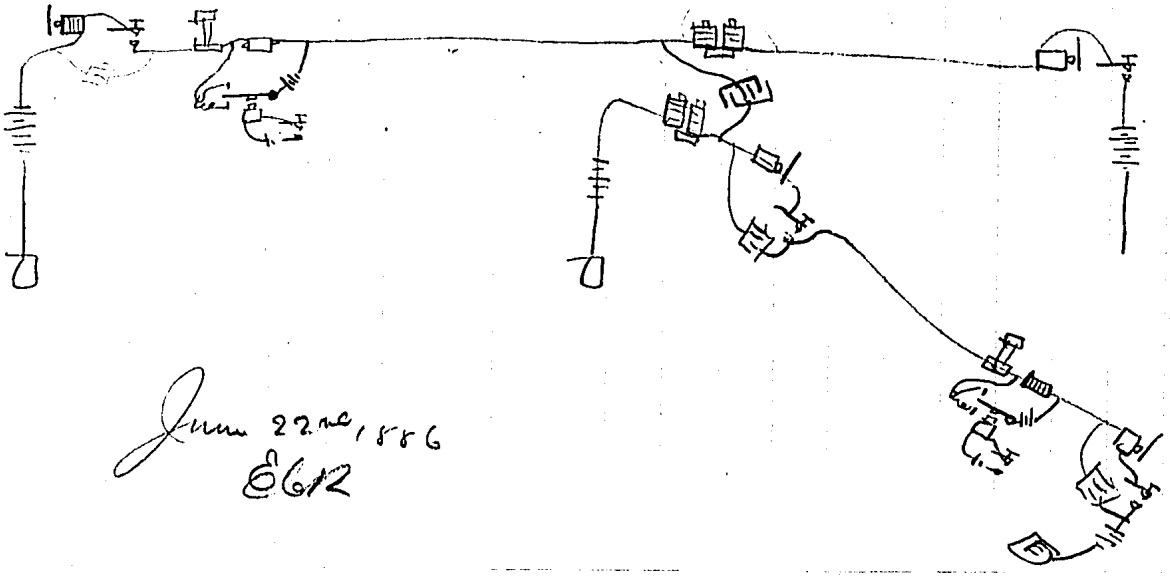


June 22nd 1886
EBR



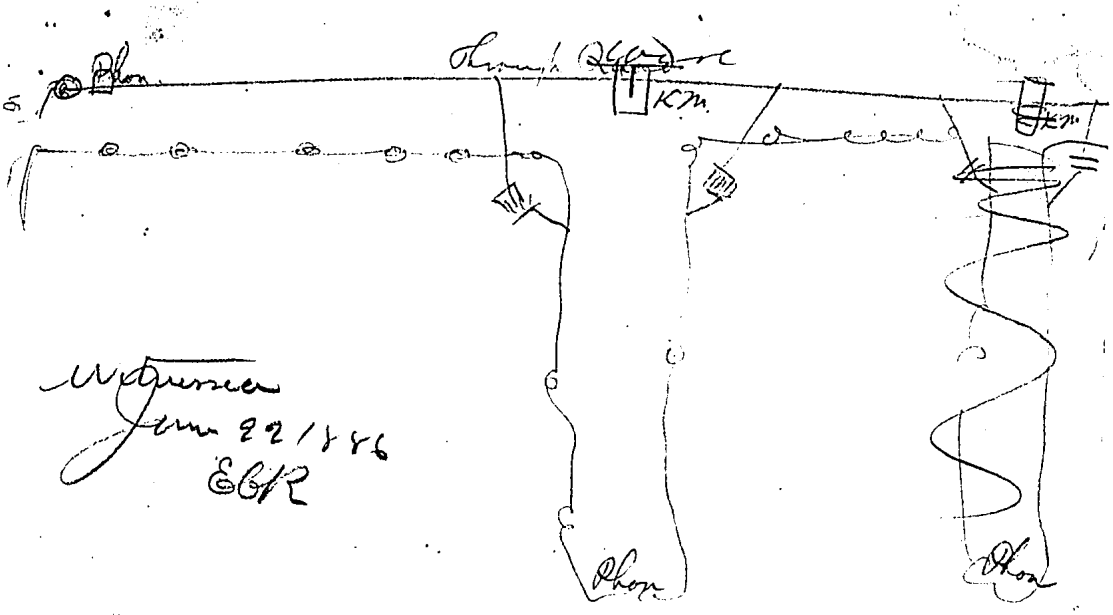
(2)

(B)



June 22nd, 1886
EBR

(3)

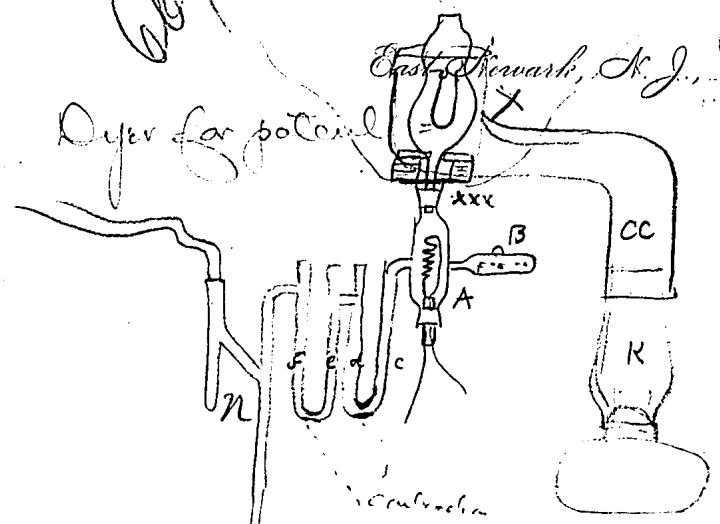


W. Guerrier
June 22/1986
EBR

THE EDISON LAMP CO.,

East Newark, N. J., July 7 1886

Dyer for patent



Process patent

Soak patent which we can divide into other patents when necessary

The object of this invention is to suppress the Mercury Vapor in the Lamp and to get rid of the vapor of Water. n is the ordinary Mercury pump. f is a Tube filled with clean Lumps of Antimony or Bismuth; e is filled with crystals of Iodine; d & c are filled with Antimony or Bismuth. A is a chamber containing an iron spiral which can be brought to a red heat by the Current passing through a Rheostat. X is the Lamp to be exhausted.

THE EDISON LAMP CO.,

2

East Newark, N. J., ... 188.

B is a tube containing phosphoric anhydride or other absorber of water vapor K is a lamp provided with a chimney CC which surrounds & serves to heat the lamp which exhausting XXX is an Electro Magnet which is energized when the filament is first heated highly. The attraction between the current in the filament & the lines of force of the magnet serving to pull or attract the filament downwards or to a central point thus keeping it straight. The filament being once set at high incandescence will not afterwards change.

The lamp heating the bulb causes all the gases & water vapor to be thrown off the surface of the glass & is absorbed by the phosphoric anhydride or decomposed by the heated iron spiral leaving Hydrogen which by its great mobility is soon taken out by the pump. The mercury vapor cannot pass to the lamp

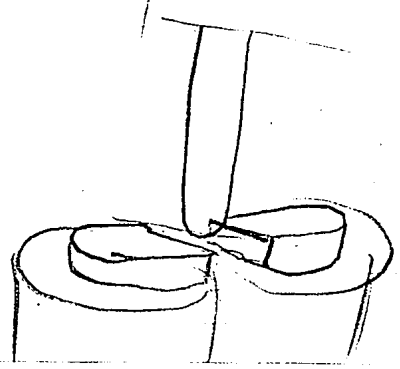
THE EDISON LAMP CO.,

East Newark, N. J., ... 188...

3

as it combines with the Iodine to make a solid Iodide of the same. The Iodine vapor cannot passes to the pump or lamp as it combines with the Aluminum & Bismuth to form solid Iodides of these metals, instead of the iron spiral other metals may be used that decompose water at a high temperature & alloys.

Instead of heating with the current, powdered metal can be placed in a tube connected with the vacuum & brought to a red heat by outside heat as a flame etc. The magnet for straightening should be arranged thus

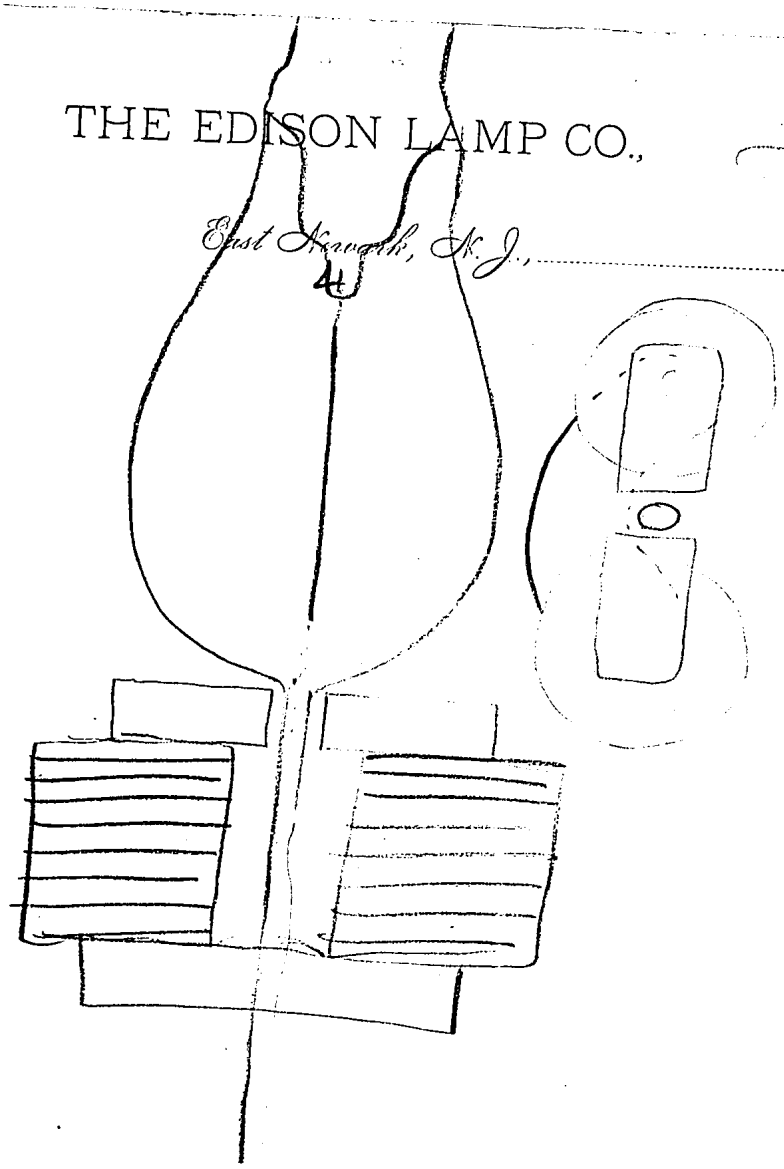


4

THE EDISON LAMP CO.,

East Newark, N. J., ... 188

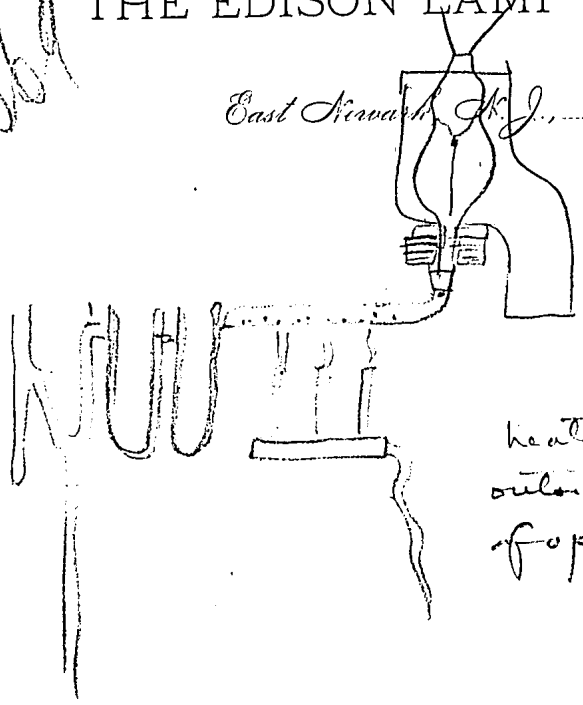
4



Instead of having the spiral in the pump each lamp may be provided with an iron wire connected across the clamp rather than the carbon filament. as the iron wire is brought up to a white heat with a ~~current of high~~ electromagnetic force less than will heat the filament. The wire when a vacuum is obtained is brought to incandescence ~~by~~ afterwards the wire is melted & by means of a magnet drawn clear out of the way

THE EDISON LAMP CO.,

East Newark, N.J., 188



heating metal from outside of lamp instead of copper & carbon,

T A Edison.

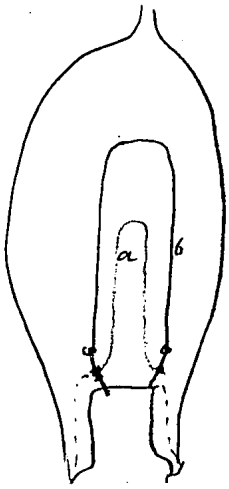


fig 4

a is the new wire
b the regular filament of Carbon

T A E

Patent acct
Lamp Co —

Flushing Park
July 1 1886

Soak patent —

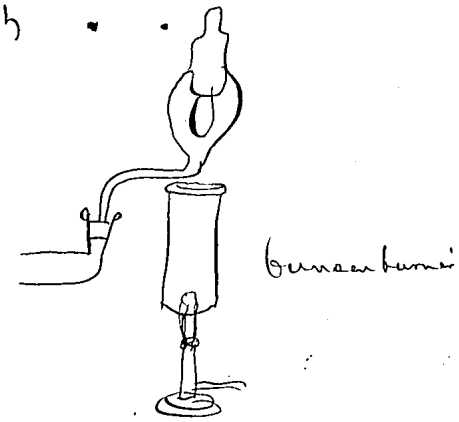
To effectually absorb all the water within the Bulb of the lamp and to cause water to be formed so that it may be absorbed so as to get rid of the Oxygen a object of the patent, ~~[illegible]~~ after the Lamp has had all the water taken from it by passing pure dry Hydrogen through it from a source of Hydrogen & all the air driven out by displacement due to the inrush of the Hydrogen, a small pellet of ~~[illegible]~~ water

absorbing substance such as phosphoric anhydride is put in the lamp and while it is full of Hydrogen put on the pump and Exhausted, and Oxygen present combines with the Hydrogen by the action of the incandescent filament & forms water ~~at~~ a low incandescence & this is absorbed by the pellet or piece of phosphoric anhydride which remains in the lamp after it is sealed off and ready for market, it also absorbs any water as water that might have been in the globe. A piece of phosphorus may be used instead of the phosphoric anhydride & this is ignited while Oxygen is still in the globe & before the Hydrogen has been passed the phosphorus burns to phosphoric anhydride

it should be put in a small receptacle so that in burning the white cloud of phos anhydride will not rush upward & coat the side of the lamp — Chloride of Calcium & other absorbants may be used but phosphoric anhydride I think is preferable, the pelet when put in the lamp must be made to fall to the bottom of the lamp where it will adhere and where it will remain during the use of the lamp, as even phosphoric anhydride gives off a slight amount water when strongly heated. ~~Instead of Hard~~ ~~a~~

Want a strong claim on this, The use of dry Hydrogen in the lamp as the gas to start with to Exhaust and ~~an~~ a powerful water absorbant Either in the pump or allowed to remain permanently in the Lamp is used, the latter probably, claim heating the filament at first to lower incandescence ~~that~~ it is to be burned at to cause the Oxygen to combine with the Hydrogen to form water —

P S I forgot to mention that, While the lamp is being Exhausted ~~it~~ the bulb is heated centrifugally by immersion in hot oil bath or from heat rising from a chimney of flame. Thus —



Make a claim for this also for
at in Combination with the A.
in Lamp & the dryer in Lamp
or pump —

Elmer

[illegible] on
cooling mixtures.
My new view with
[illegible] of [illegible]
is [illegible]
Shall have certainly
cold [illegible] or
any [illegible]
[illegible] [illegible]
of my [illegible]
[illegible]

[illegible] from
hydro carbon
while [illegible]
burning in
lamp. See
what [illegible]
See if [illegible]
for [illegible]
[illegible]
[illegible]

Patent No 2
Lamp Co account Llewellyn Park
Soak patent July 1 1886

68

Dear -

Take out patent on the a sprengel pump same as we use except the use of Sulphuric acid instead of mercury to get the vacuum
The fall tube is about twenty feet long we use lead or Hardrubber fixtures & mechanical pumps to handle it = The Sulphuric is very strong, get broad claim, object is to dispense with mercury as its expensive and dangerous while the men can protect themselves by wire masks for accidents, they suffer from the noxious mercury besides it gets the vacuum free of mercury vapor ~~on~~ The ~~that~~ very little vapor from Sulphuric acid may be absorbed by a substance which will combine with it such as an oxide of

a metals through which the vapors must pass before getting to pump - it acts also as a drying agent though I prefer to still use the phosphoric anhydride in addition - it doesnt break the tube by pounding + the tube is always clean -

Edison

P.S. No difference in pump from the regular except length of fall tube.

July 7 1866 T.A.E.

Object is to get rid of the water vapor

fig one has a contraction C to seal lamp off at pump. A is tube filled with glass coated with phosphoric anhydride or other water absorbing agent & is a contraction drawn to a point & sealed E is two or 3 turns of iron wire hung on the hook. The Lamp being sealed is first put into an iron chamber & brought up to 600 to 800 degs fahr. The aqueous vapor being absorbed by the phosphoric acid in fact combines with it & cannot again go driven

2

off by heat. The bulb is kept at this temperature for an hour or two it being glass sealed no atmosphere can enter ~~at the top~~. The steam is then passed through a section of rubber tube coated with Vaisalene & put in the Cup G of the pump. a magnet F is then brought up to G is the attraction for the iron around the hook E is sufficient to break it off & the pump is started. The phosphoric absorbs the water entirely

an as the diffusion of aqueous vapor is slow none again enters from the pump as the lamp is heated by a chimney & lamp while being Exhausted.

Fig 2 shows a method of decomposing the Water by powdered clean iron in B. The Lamp is put in a chamber & heated to 600 or 800 deg fahr while the steam extends downward or outward through the chamber is is heated to a dull red. The iron combines with any

free Oxygen as well as decomposes the water vapor setting Hydrogen free. The Beaded hook E is broken off by magnet.

fig 3 shows an iron spiral which acts the same as Fig 2 (Except the spiral is kept red hot while the lamp is in the heating chamber) by an electric current.

Dyer & Seeley

Patent.

July 7 1884

#269

Fig 1

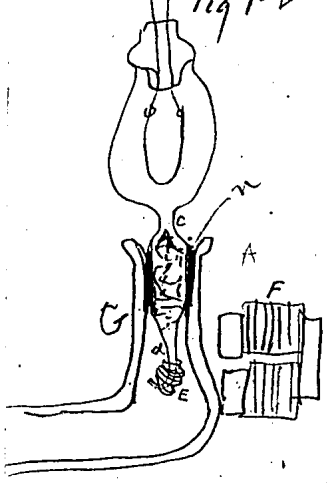
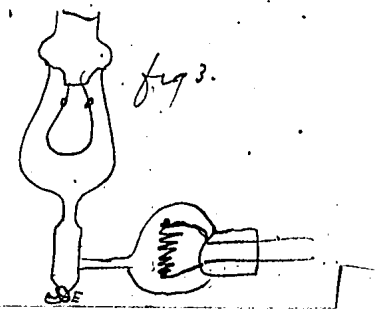
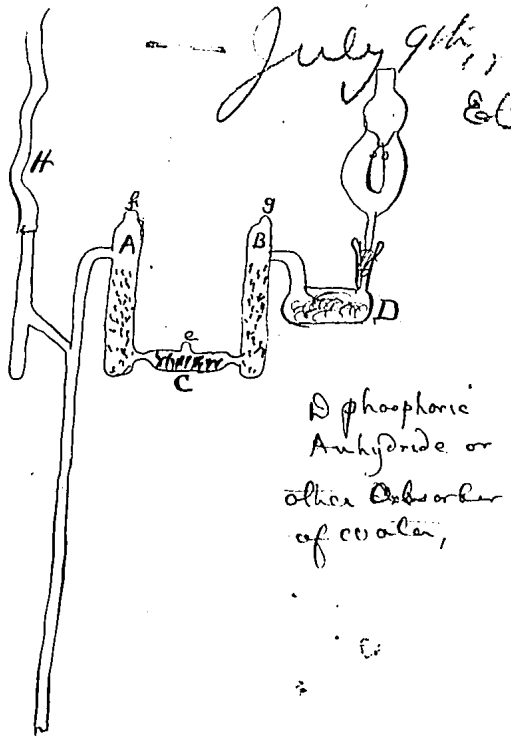


Fig 2

fig 3.



July 9th, 1902
E.G.K.



Dear — Take out patent and assign to Lamp Co for following. They are a series of Sock patents hence broad claims

A & B are tubes containing an absorbant of Chlorine Bromine or Iodine Vapors such as Quicklime & such metals as pieces that Combines with Chlorine at ordinary temperature or slight increase of temperature above the ordinary such as Copper Zinc Iron, alkali metals

C is a tube containing solid Iodine, or a salt of Iodine which gradually gives off vapors of Iodine, or a chloride which gives off free chlorine gradually, or a chloride that gives off its chlorine (?) heat slowly by a gentle heat such as sesquichloride of chromium, or an inert porous material like Charcoal etc Saturated with Chlorine ~~gas~~ Bromine & salts acts the same as chlorine.

The object of this trap is to prevent mercury vapors from passing from the drop tube to the lamp. Iodine Chlorine or Bromine ~~all~~ all attack mercury at ordinary temperature forming an Iodide Bromide or Chloride Consequently no mercury reaches the lamp — The object of tubes A & B is on the one hand to prevent these gases or vapors from going into the fall tube where they would combine with the mercury & dirty the tube so it wouldn't work & on the other hand prevent the gas used from ruining the Lamp, the metals ~~are~~ in tubes are attacked

by the gas & form solid Chlorides, Bromides or Iodides. There are absorbant substances that will absorb the gases in the pores of the same that could be used in A & B such as ~~chest~~ oxides magnesia, Charcoal & other inert substances that absorb gases, a compound could be used with which the gas or vapor combine, such as Quicklime in the case of chlorine. The object of getting the Mercury out of the globe is to ~~prev~~ diminish the blue and lengthen the life of the filament.

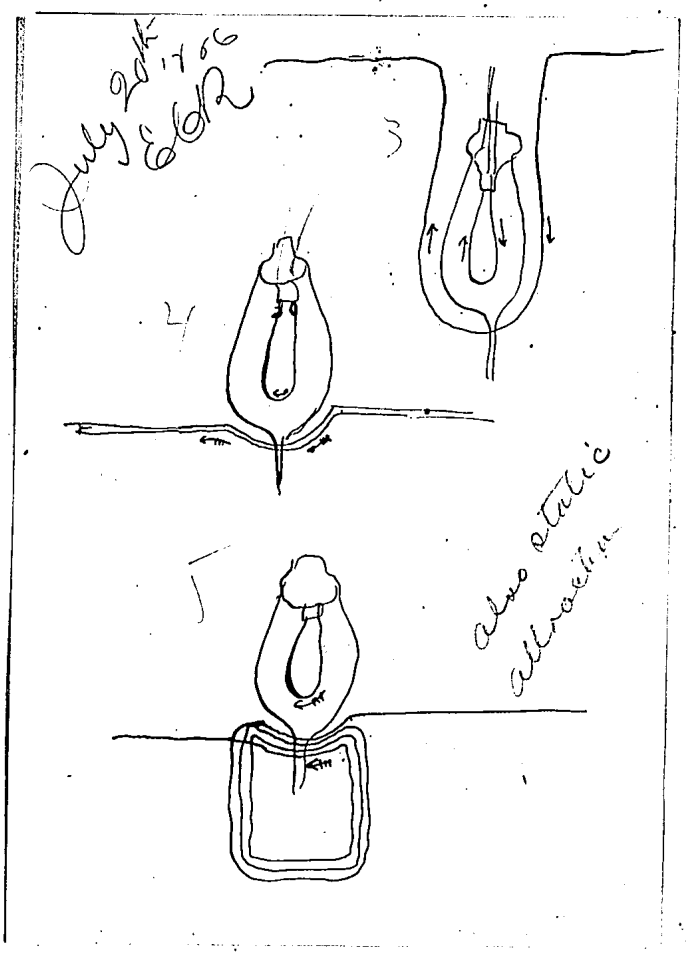
I suppose you can make a claim for a chemical substance between the lamp and the Mercury pump which will combine with the vapors of mercury to make a solid. There are other chemical substance which when mercury passes through or over them combines besides the ones named such as heated sulphur, vapors of nitric acid

in fact any chemical could off hand suggest a dozen things in A B & C that would accomplish the object hence I want to get very broad claims —

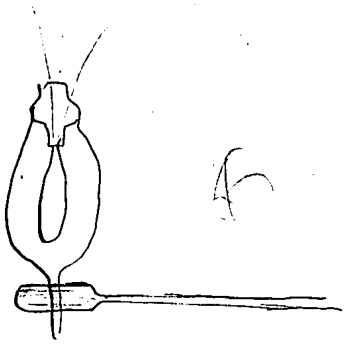
T A Edison

Ad Menlo Pk
July 1 1886

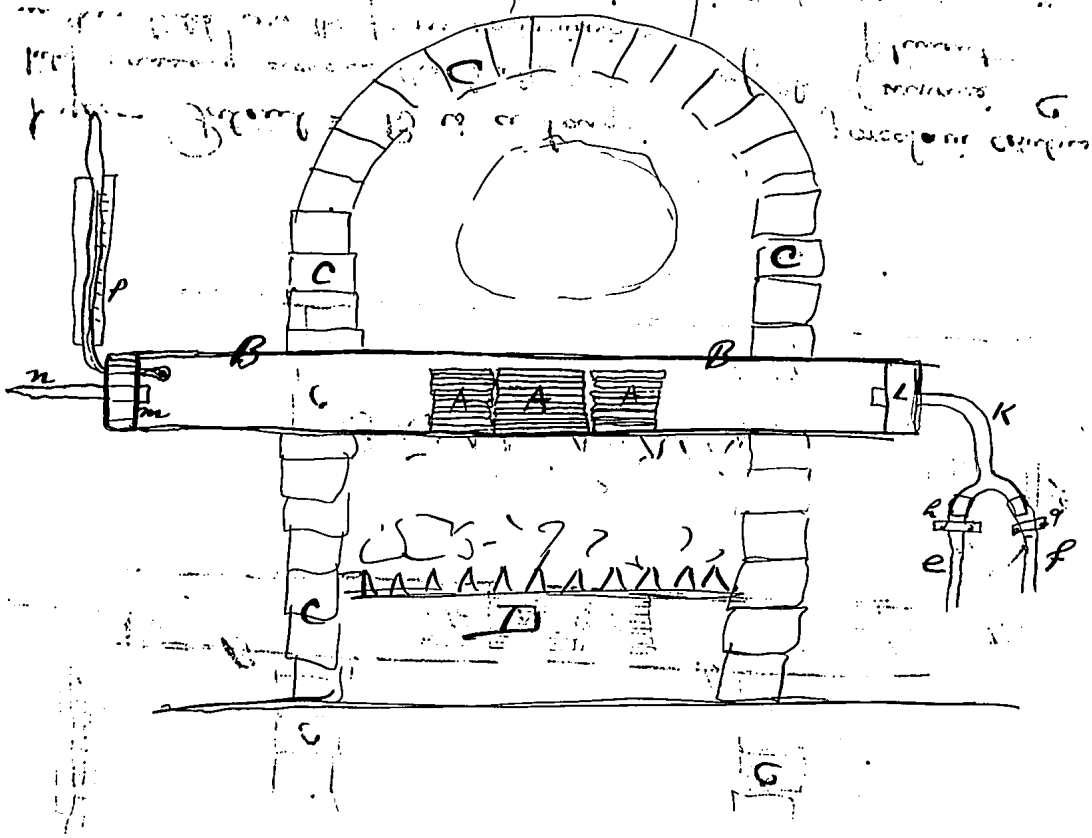
T A E


July 20th 1966
EDR
3
4
5
also static
allowable

July 26.11
1496



4



Dyer – Patent: B is a large unglazed porcelain combustion tube passing across the central part of the furnace C in this tube are the forms containing the fibre or filament of bamboo or other material not yet carbonized. The moulds keep the filaments under steam + pressure, The Combustion tube is closed + luted at both Ends p is a thermometer to show the temperature of the Exit gases n is a tube with fine bore on End to allow gases to pass out, K is a two way tube one connected to a Hydrocarbon fixed gas or Vapor The other with Chlorine. both gases or vapors are dried by ~~dessicating~~ drying agents to take up the water vapor before entering the tube, The aspect

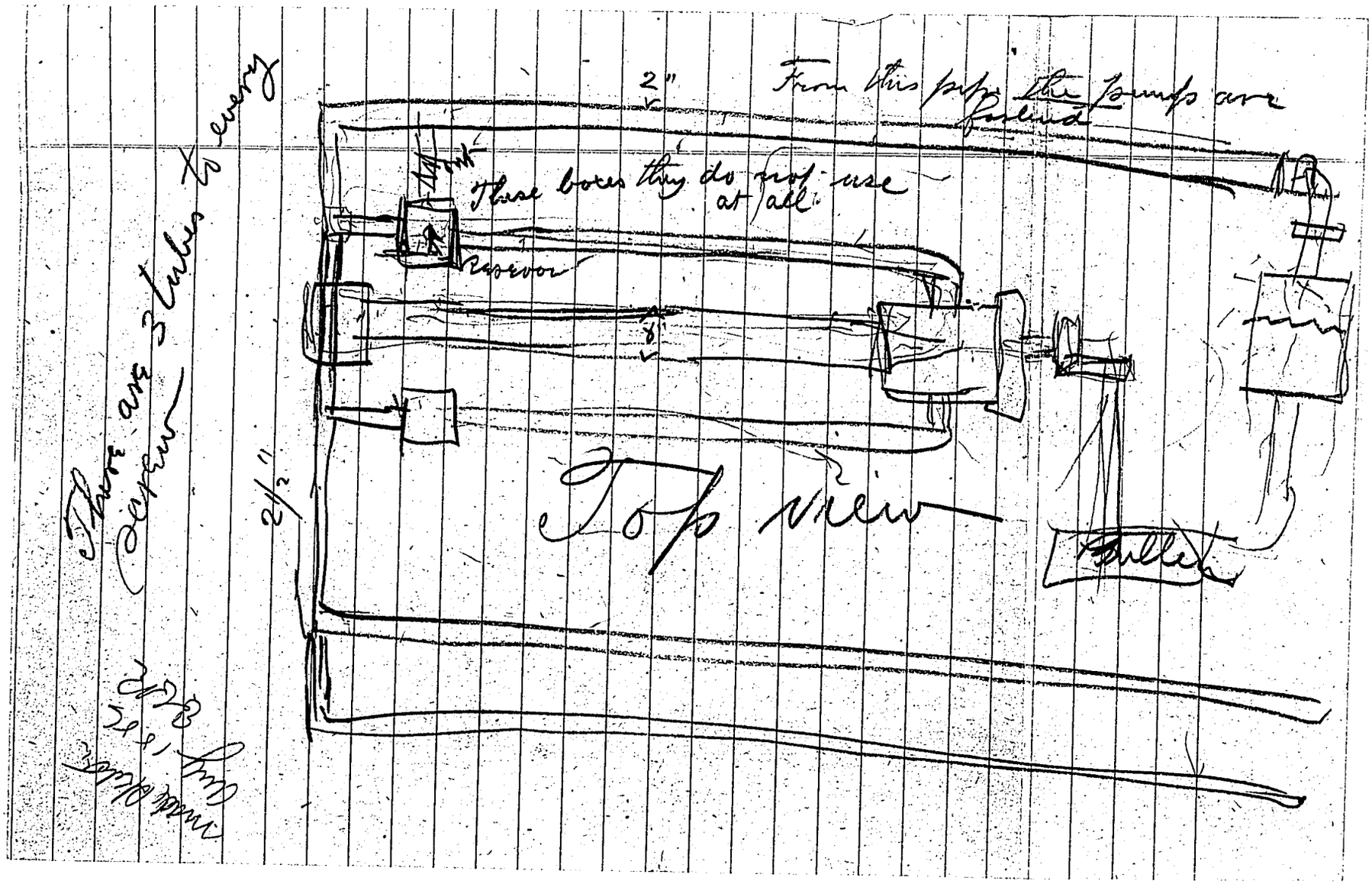
August

of the Chlorine is to cause the Hydrocarbon gas or vapor to decompose at a lower temperature than the Chlorine having an affinity for the Hydrogen of the Hydro carbon although the use of Chlorine is not absolutely necessary it is better to use it or any other gas which has an affinity for Hydrogen such as Bromine, as Carbon will be deposited in an early stage of the Carburization — The gases are passed through slowly the free the tube of air & water vapor, the furnace is started at a gentle heat which gradually increases. The gases passing slowly through during the process, more Chlorine than Hydrocarbon should be passed say three to one of the Hydrocarbon, and the heat is continued up to the highest heat of Glass will bear by a blower. The fires are then drawn & the tube allowed to cool the Chlorine only being allowed now to pass & this is continued until the tube is below 400 degrees for when it is taken out the forms removed and the tube filled with fresh forms of Carbon several tubes can be put in the same furnace. Its not essential that a Hydrocarbon gas should be used as Bisulphide of Carbon can be used alone, without Chlorine,

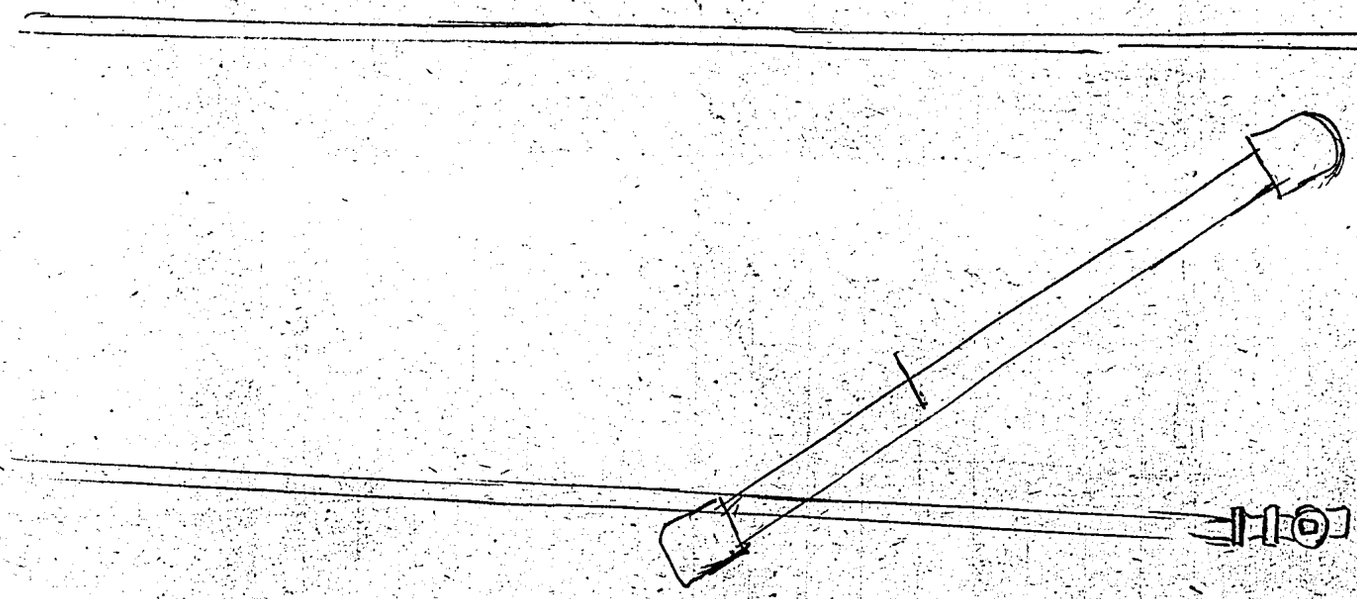
See key note = There have been laboratory experiments in analysis where flax leaves & stems etc have been put in a combustion tube & carbon & Carbon deposited therein. So you will have to make carbon in the light of this = & put in a different article & shows means for accomplishing the result.

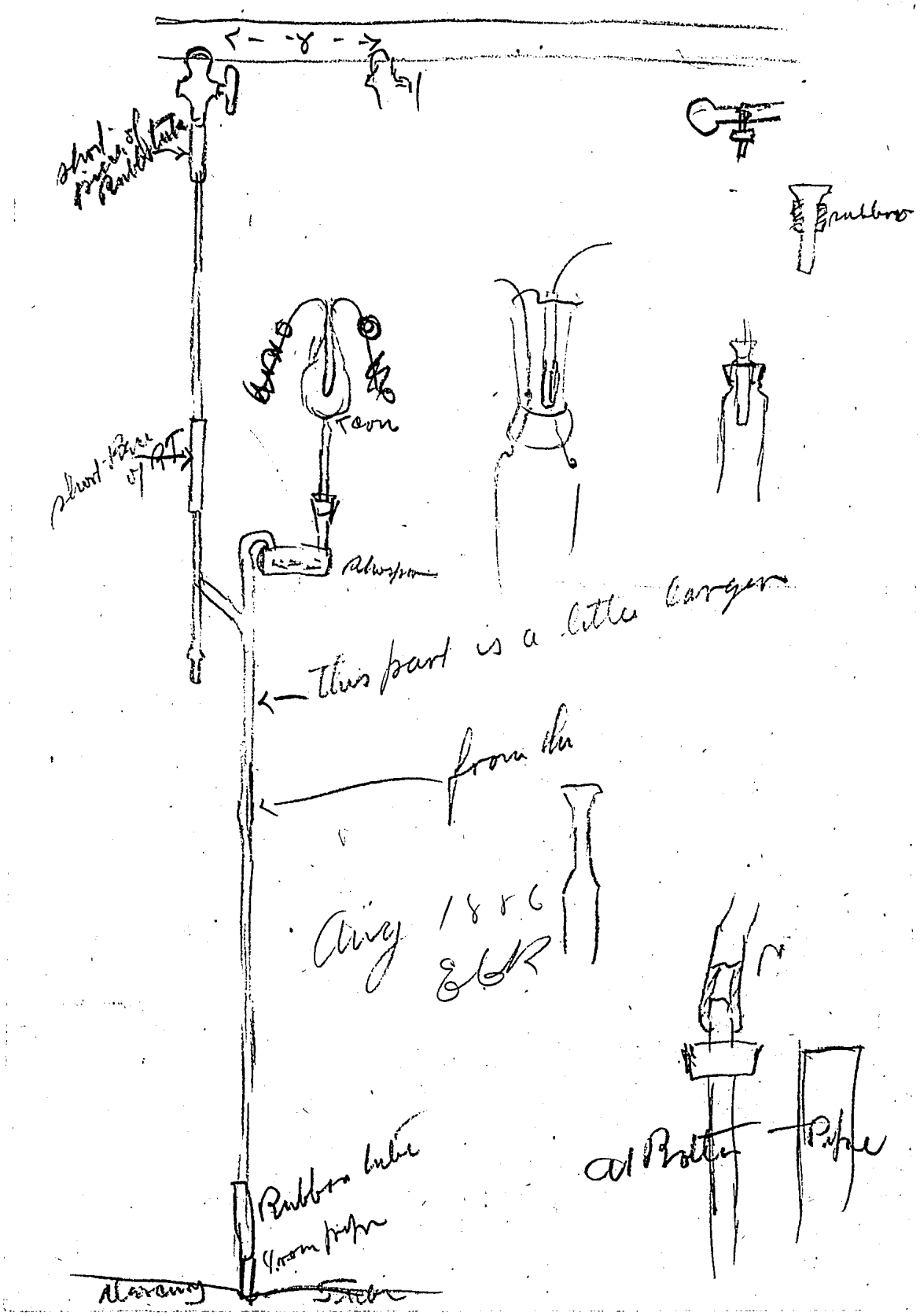
Tor

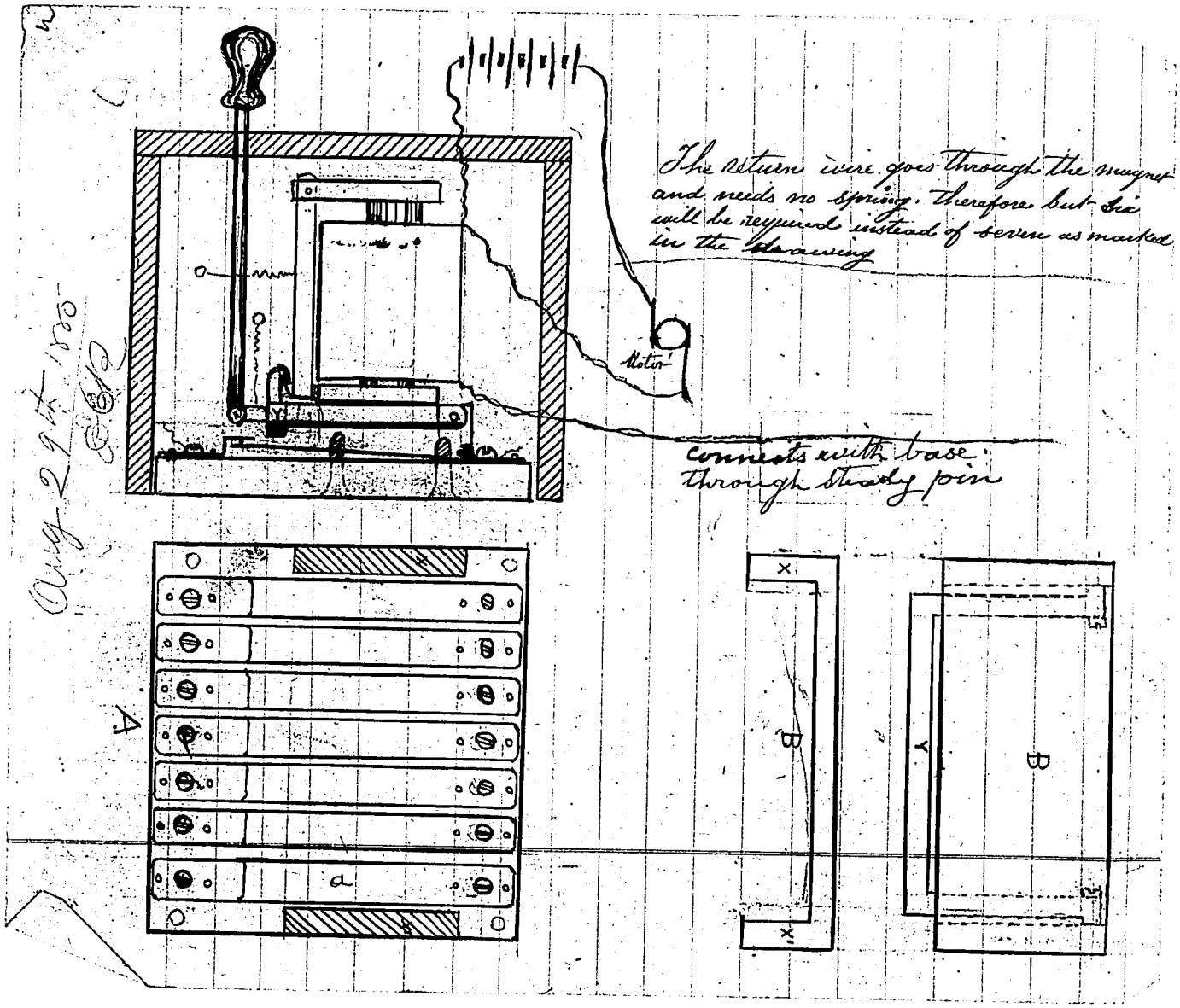
Aug 10 1886


2"
From this pipe the pumps are fed
These boxes they do not use at all
Reservoir
8"
2½"
There are 3 tubes to every
Top view
Bullet

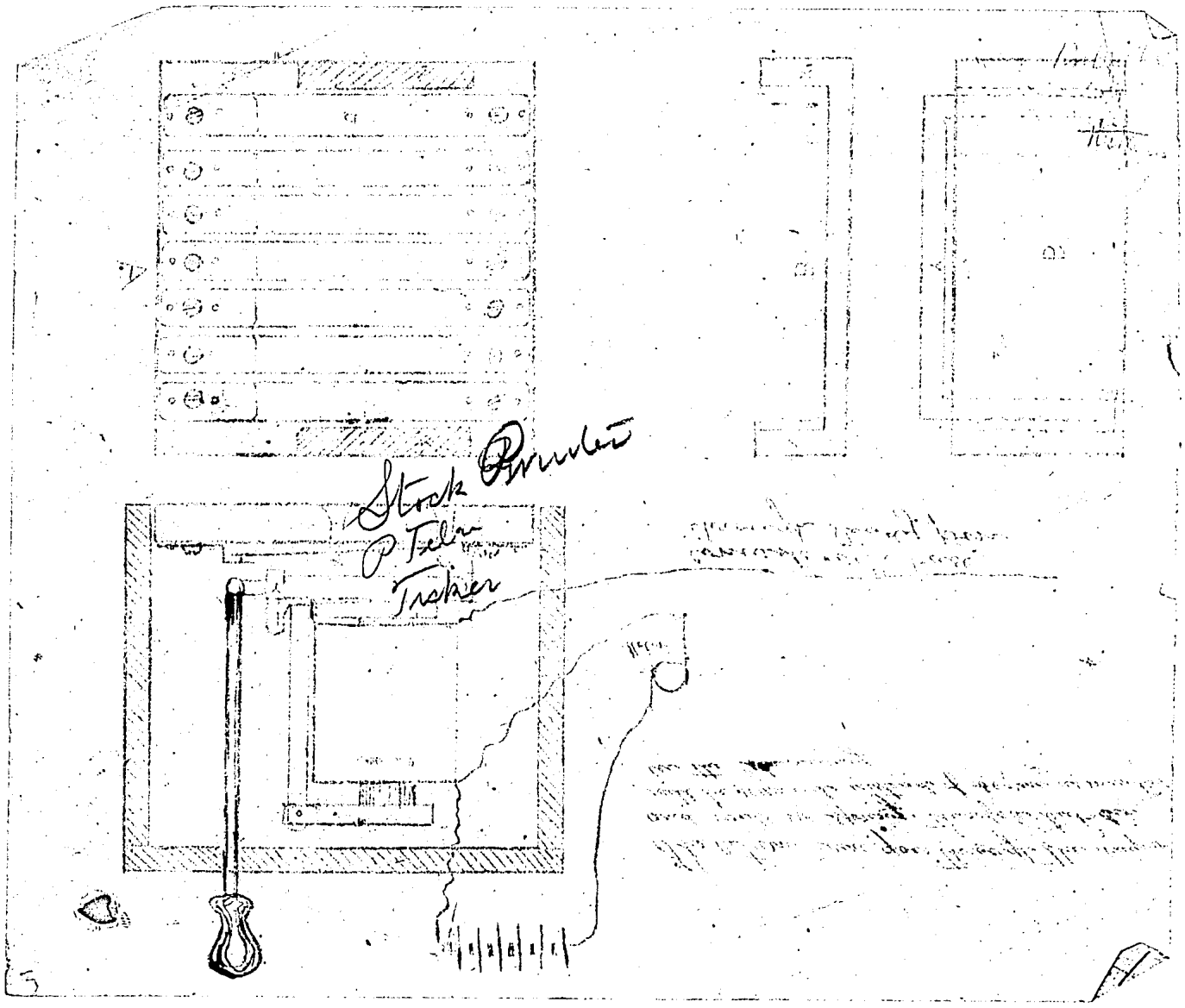
3-174
58 in new



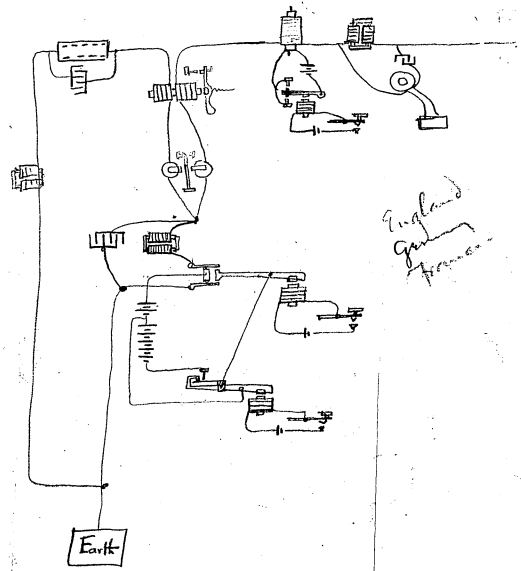

short piece of Rubber tube
Bulbs
Bulbs
Tron
short piece of RT
Absorption
This part is a little larger
from the
Aug 1886
EHR
Rubber tube
(from pipe)
Alcoholic
Stem
Oil Bottle
Pipe



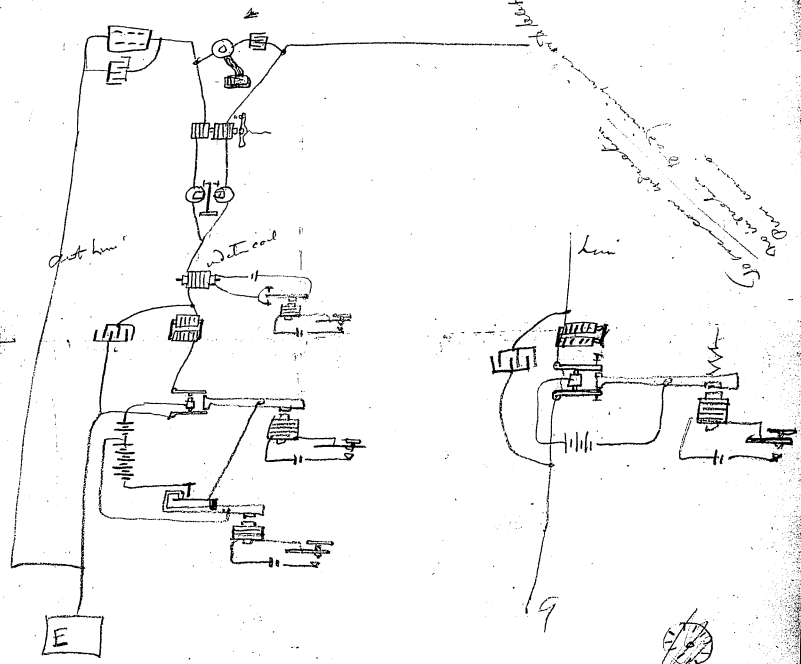
Aug 29th 1880


Stock Quotes
Tele
Tracker

Quadruplex on phonoplex wire



Sextuplex



Sept 27th 1885

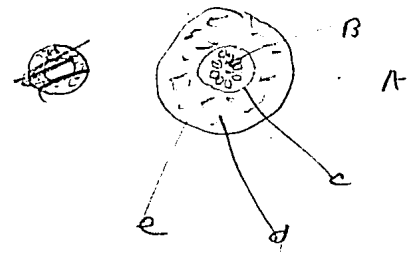
Inc. Sept 26 1886

Dyer & Pratt =

180

The object of this invention is to make ~~a filament~~ obtain a filament of vegetable matter capable of forming a filament of carbon after carbonization by heat which shall be free from pitti seams and ~~be~~ have all parts of the body of the same relative density. I have discovered that the roots of the palms + many other roots have at their center an extremely hard, homogeneous portion from which filaments can be prepared — after drying — especially the scrub palmetto which has a root consisting of a spongy exterior and a central core ~~of~~ like cylinder in the center of which is a perfectly round cylindrical fibre in certain kinds of the root and ~~[illegible]~~ in others a central part from which a cylindrical or flat filament may be cut. fig 1 shows this kind

Fig 2

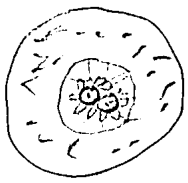


B is the outer shell of the root a the spongy material c the large central ~~p~~ core = A is the solid material surrounded with hales very close to each other by splitting the ~~[illegible]~~ core c the central part may be obtained nearly round thus.

Fig 3

2

In other roots from the scrub palm or palmetto which grows abundantly in Florida —
There are one & sometimes two perfectly cylindrical fibres with small central holes in them which do no harm — These fibres are obtained by splitting the central core



A

A

These fibres have no pithy seams but are the aggregation of an immense number of parallel fibres locked ~~together~~ to each other with considerable force —

3

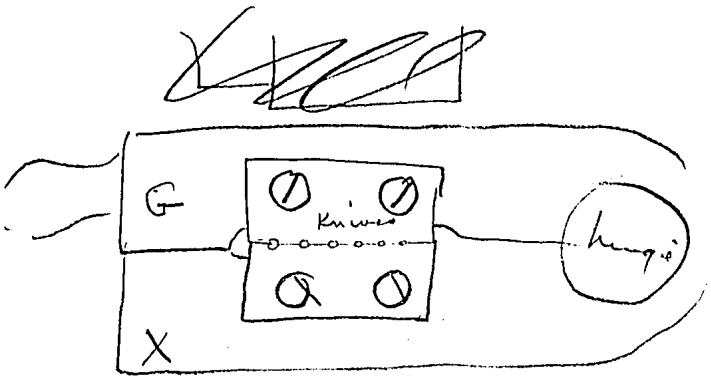
The ~~roots~~ roots should be gathered which alone the fibres or material taken therefrom and allowed to thoroughly dry before manipulating them to put them in shape for use.

The method of preparing the fibre is by drawing them through a cylindrical cutting die made in two halves. The holes being graduated from large to small the filament being drawn through successively so as to take a slight shaving each time

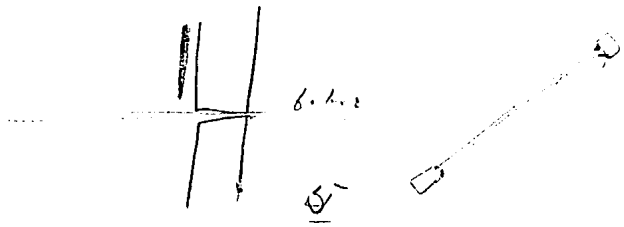
fig 3 shows the apparatus

4

[illegible] from [illegible]
[illegible] - [illegible]



The faces of the knives can be ground to keep them sharp — X is fixed G is provided with a handle to open



The fibres are cut the right length and drawn through the first hole afterwards about $\frac{1}{4}$ of inch at each end is not drawn through the smaller holes this allows of enlarged ends on the fibres which are handy for clamping after the last cutting hole. The filament is drawn through a polishing die —

Dick Must this go in two patents - I want to get a broad patent for making a filament for carbonization for Lamps made out of the central part of roots of plants or trees —

also a specific claim for the ~~fil~~ cylindrical fibres & central part of the roots of palms or palm family — also for the method of forming cylindrical filaments with a central enlarged ends by ~~[illegible]~~ cutting dies. split or not, its a cutting draw plate not a draw plate like wire drawers — also for the split dies for allowing enlarged ends —

Dick Patent. Sept 26 1886 -

685
686
687
688

~~Then~~ I take the vegetable filament before carbonization and soak it for several hours in a solution which contains dissolved carbonizable matter such as sugar molasses, Licorice, Coal tar ~~or~~ these materials permeate the interstices ~~between~~ between the microscopic fibres of which the filament is made up the filament is then taken out of the solution the surface cleaned from the adhering solution & then allowed to dry. Afterwards it is placed under steam & pressure in the moulds & then put in closed boxes & carbonized the extra material being between the fibres carbonizes & seems to lock them together and thus cause the electric current to pass through all parts of the filament equally clean - ~~[illegible]~~

The strength of the solutions should be of a consistency a little less than table syrup - it may be varied within wide limits and still accomplish the results —

Claim soaking the filament of ~~carbon~~ previous to carbonizing in a solution containing a carbonizable material in solution, —

Dick - I think some one has soaked wood in sugar etc & afterwards carbonized same

for arc carbons, so draw your claim accordingly

2nd patent

Doing the same thing to filaments already carbonized or partially carbonized & then carbonizing them again & fully

Drek

Carré makes his arc carbons by squeezing the compound of ground carbon & tar thinning it carbonizing & then soaking in sugar etc &

recarbonizing - hence you should draw your claims to get around this,

prepare these immediately

See back
also Carmen Apts

Patient [illegible]
[illegible]
[illegible] C.

[illegible]

a - [illegible]
[illegible]
+ [illegible]

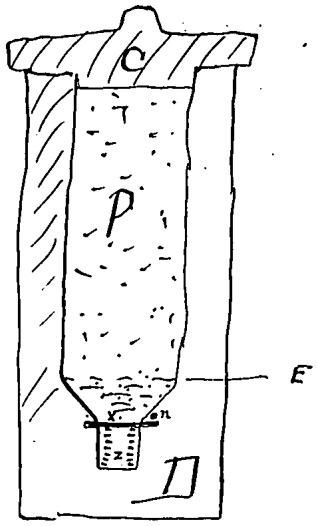
b - [illegible] cash
+ [illegible]
+ [illegible]

c - [illegible] carbon
[illegible]
[illegible]

Form L. 1200-2-13-'80.

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

New York, Oct 8 1886 188



Patent =

Carbonizing under pressure,

Z are a number of filaments of organic matter, D is a Crucible – C the Cover X a piece of Carbon to prevent the filament from going upwards, The Crucible & Cover is made of Carbon (ie) plumbago D is filled with powdered Lead up to E & from there to the Cover with large pieces of Lead

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

2 C

New York, 188

The whole is placed in a furnace and gradually brought up to a white heat, when the lead melts it surrounds the Carbons completely and produces a great pressure on them due to the Column of liquid Lead - and as the lead does not boil until the melting point of wrought iron is reached the filaments are perfectly Carbonized & consolidated by the pressure; the Lead being liquid allows them to Contract without imposing much resistance — The mould is taken out before the lead has solidified and poured out leaving a little dross around the Carbons which can be removed by acids — In practice it is preferable to put a small carbon box at the bottom of the Crucible &

Form L. 1200-2-18-'86.

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

3 c

New York, ... 188

Cover the whole with a powdered alloy of lower melting point than lead so that the carbons will be surrounded with a liquid before any great change takes place. other metals may be employed such as tin Zinc Etc —

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

688
689 1 X
6d
6pD

Form L. 1200-2-18-'86.

New York, Oct 8 1886

Patent.

Filaments are formed from oxides put in a plastic state by mixing a small quantity of material which combines with the principal oxides such as an alkaline silicate in small quantity mixed with pure oxide of Alumina, Magnesia Zirconia. These with water became plastic like clay when finely divided and can be squeezed through dies by pressure in the form of "cylindrical filaments." These being bent in shape desired are brought up to a full red heat afterwards they are taken out & soaked in a carbonizable compound in a liquid form such as sugar, licorice, &c

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

2 X

Form L. 1200-2-18-'86.

New York, 188

The penetrates all the pores and then the whole is ~~reco~~ put in the furnace in a box with powdered anthracite & brought to a white heat the walls of the pores & surface are coated with Carbon; ~~then~~ as the Carbon does not reduce these oxides, the filament will stand a high temperature — If it is desired that a lower resistance filament be obtained a second soaking & recarbonization can be had or the original porcelanic filament may have incorporated with it a small quantity of the Carbonizable Compound in this case no alkaline silicate is necessary as the Carbon will act as a flux — The great advantage of filaments made in this manner is that they have very high resistance hence

Form L. 1200-2-13-'80.

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

3 X New York, 188

very small copper wire may be used to distribute light over a large area which is of the highest importance

See affidavit ~~summary~~ filed.

Also for 263145

copy

approved

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

/B

Form L. 1200-2-18-'86.

New York, Oct 8 1886 -

Patent -

I form a filament of clay by forcing it through a hole by a press same as they make arc Carbons etc - or roll it out in sheets and stamp the filament out while plastic, if it comes from the die it is bent in shape and slowly baked until nearly all the shrinkage is out - I then put several in a mould surrounded with powdered anthracite Coal & bring them up to a white heat - afterwards they are taken out and put into a tube which can be brought to a white heat & a hydrocarbon gas or volatile compound passed through it this deposits carbon over the whole surface of the porcelain filament, afterwards the porcelain is eaten away by Hydrofluoric acid or other solvent, the Carbon filament only shell put in a holder on the Ends of the wires running through the inside part of the Lamp & Electro plated thereto -

Form L. 1200-2-18-'80.

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

2 B

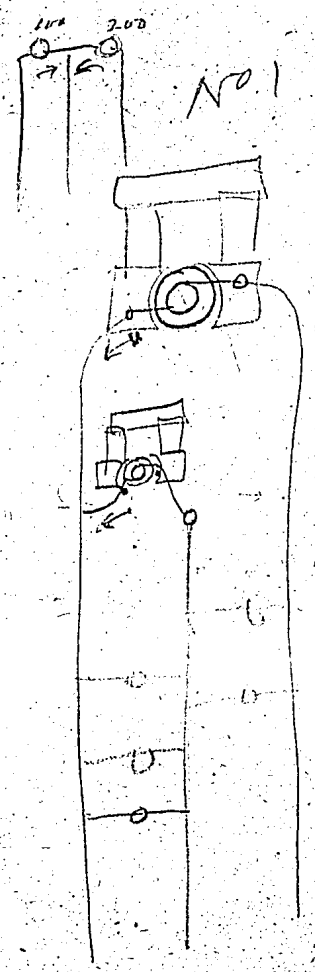
New York, ... 188

any oxides or compound which can be moulded or put in shape while plastic & which will stand a white heat will answer —
Plumbago may be rubbed over the surface of the new conductor filament so that its entire surface becomes a conductor conducting the current through the filament of plumbago its heat to incandescence & a hard coating is formed on the surface while it is immersed in an atmosphere of a gaseous compound containing carbon — If an oxide like pure alumina, magnesia, or zirconia be used it is infusible hence it will not be necessary to eat it away by acid or other solvent,

Tc E

Les ballons en métal comme
l'aluminium, les avis

A Popley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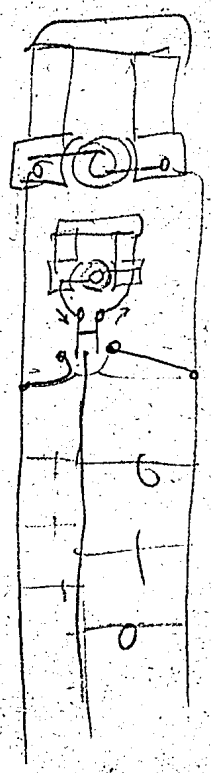
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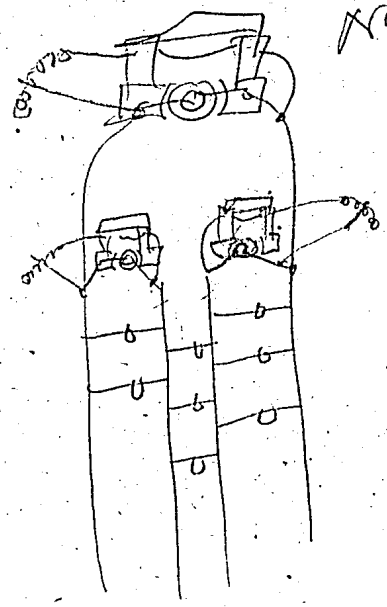
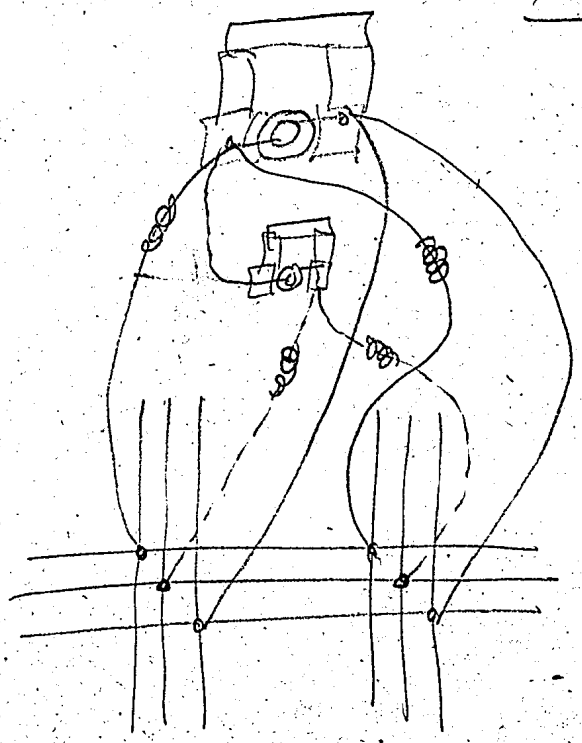
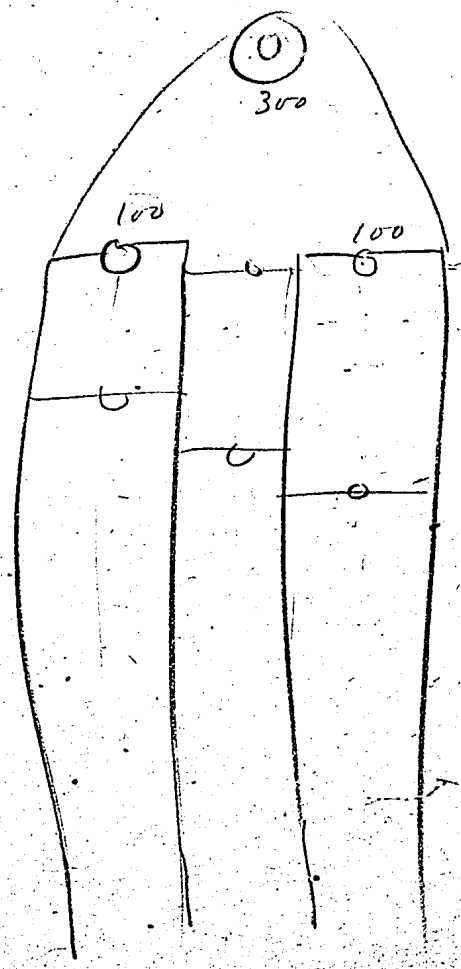

No 3

No 4



6 X 9

4.25



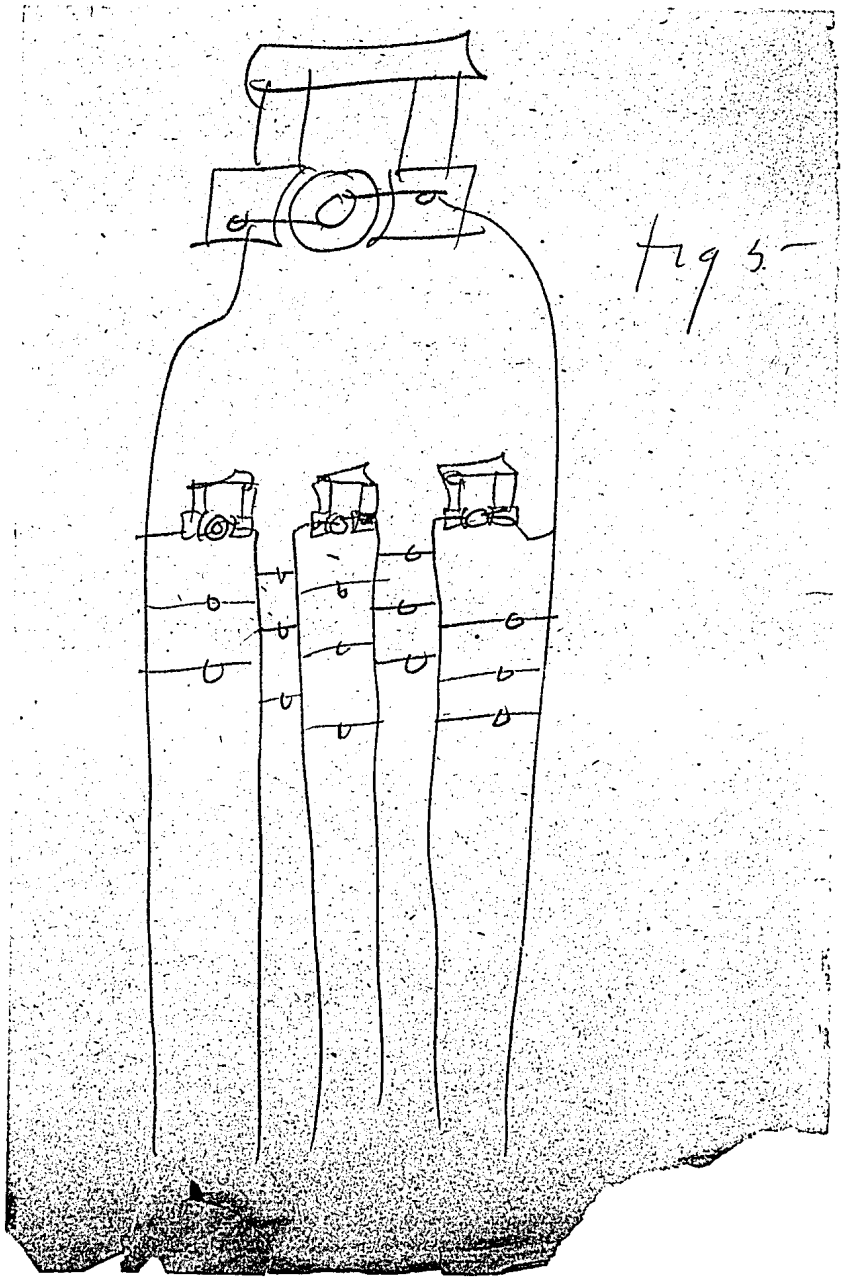


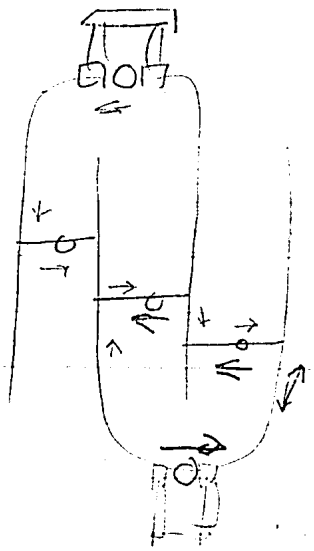
Fig 5.

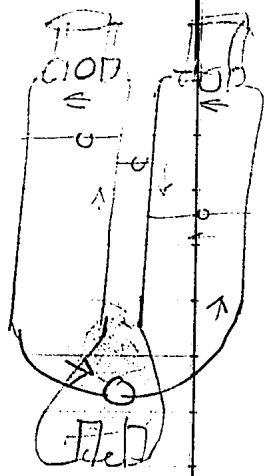
Hence 35-830 hp —

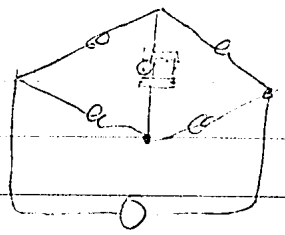
Starting with 35000 hp
& 92 pct dynamo & loss 2640. reducing to wire
at Niagara 30360. Loosing
15 pct on wire loss 4554 leaving at
Motor terminals Buffalo 25806. Less Motor
loss 2064 - leaving 23741. At the
dynamo terminals running again dynamo
& loss 1899. hp - leaving 21842 -
Leaving and loss in Conductors in
City & pulling cable in Government motor
nets. (Leaving 1,747.) ~~leaving~~ 20095 hp —

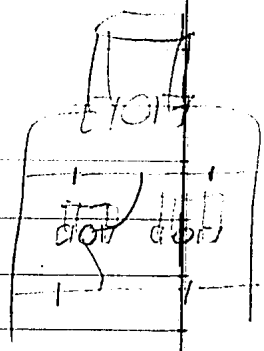
As I have a loss in City wires
for lighting. 5 per cent. of 10000
hp — & ~~10~~ 10 per cent on 10000 hp
for Light & Gates overlap -
~~Therefore I must have on~~ 500 hp is
5 per cent of 10000. hence I must
add at Niagara 830 hp - for the
12 pct loss on lighting wires I must
add 2000 hp at Niagara —

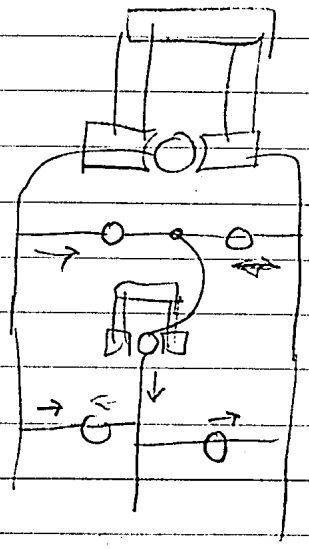
36 pct [illegible]
[illegible]

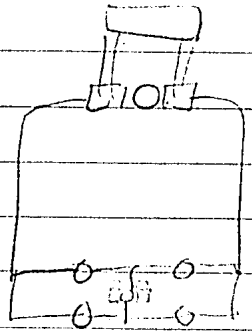


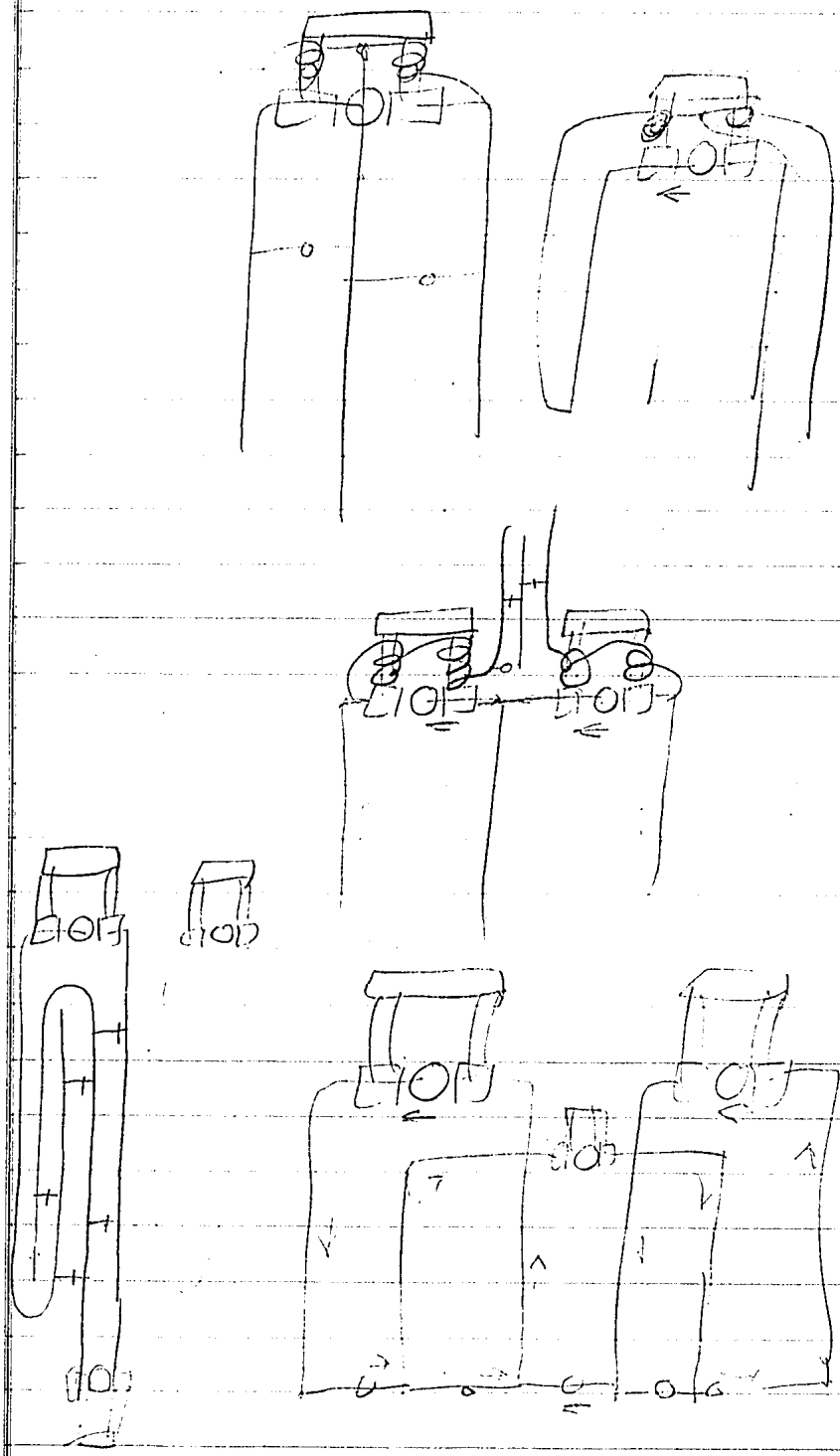


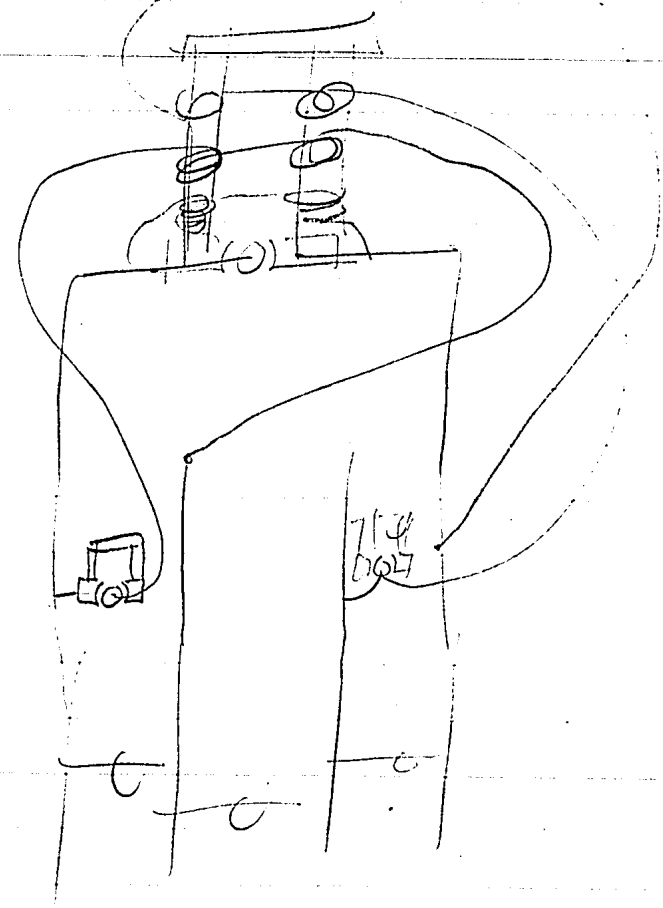


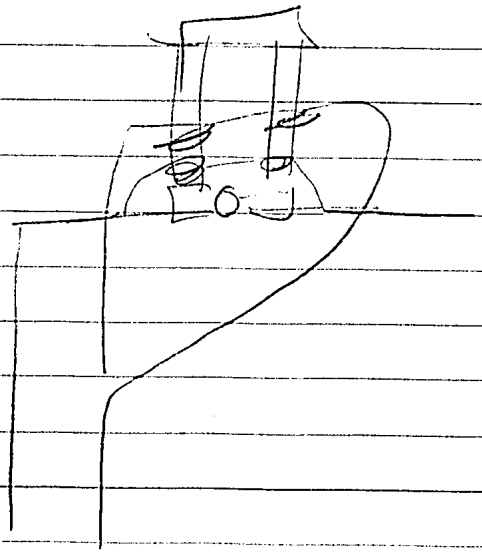


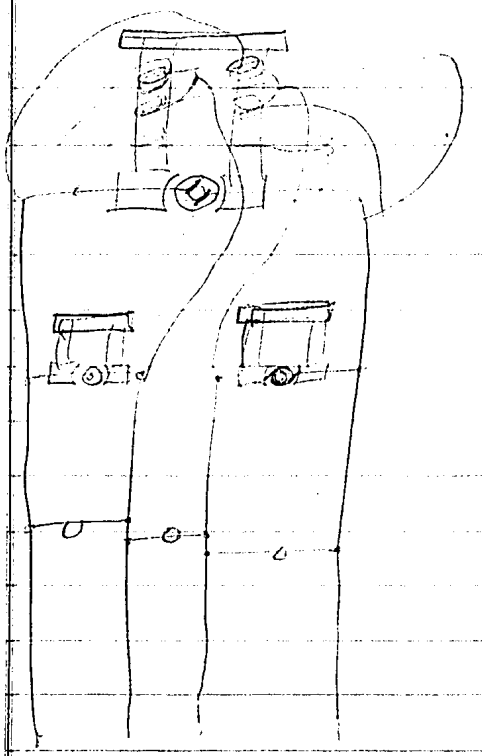


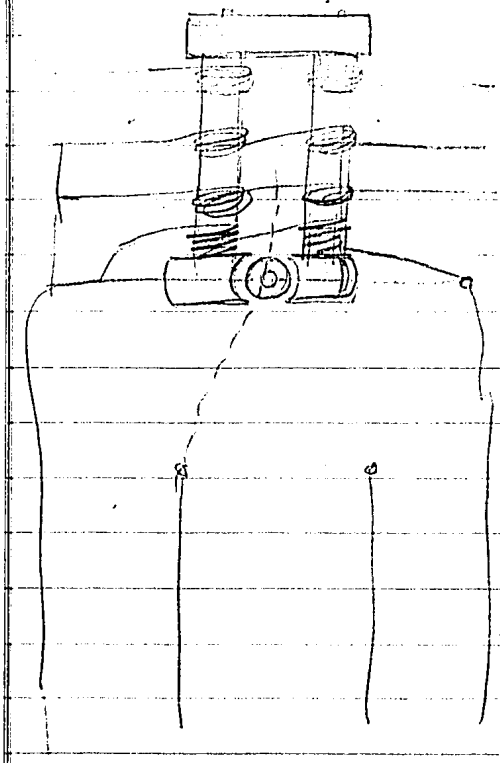












Flame out

4 million

40.
20000
800000

300/5000 (16.
300 20
2000 36.
1800
2000 25-
61-

75
20000
$1,500,000

150
28
1200
300
4200

30,000

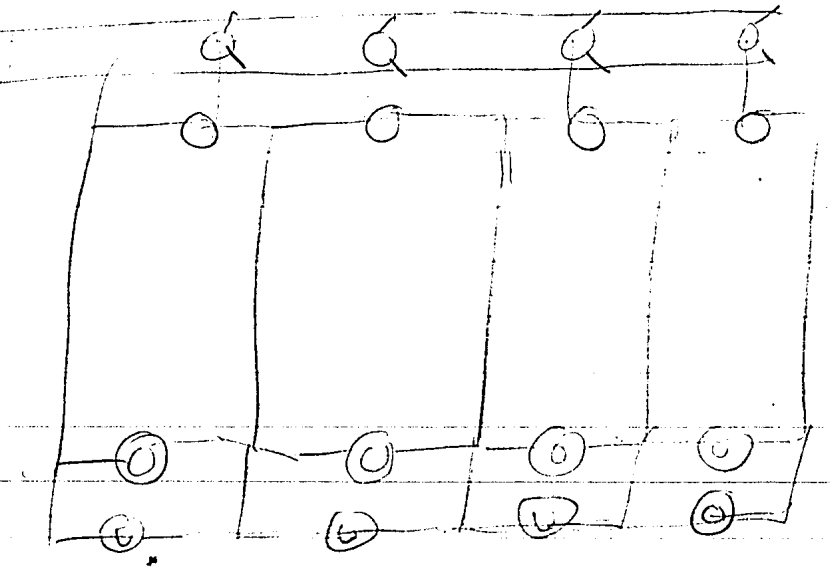
14 tons -
4
46.

7
4
28 tons 5 L.

336.
340
1344
9084
1142 40

85
72-
60

140
168
2
336.



17) 300.00 (17.647
170
130
110
102
80
68
120

6000 [illegible]
3

118
4

6000 — 17 miles 17 pots
3000 — 1,5 5 8,000
1500 — 7,5 5 2,000
750 — 3,0,2 0 5,000 — million dollars

30 million — 17 miles 17 pots
7,550 000 — 8-5 = 17
1,888 000 — 4·25 —
472 000 — 2·125
117,000 — 1 miles 17 pots

10 000 hp — 58 600 — 8
117

500 watt amp per hp —

10000 amps.

28000.
14
112000
28000
392000

44
500
35200

44/1000

4400
1000
33000 / 4400000 (135
33000
11000
9900

26
60
1560

26000
14
104000
26000
364000

135 | 100 volts, 1000
200 500
400 250
800 125

268,435 456 CMU

125-amperes

804 lbs to 12 125. amp

10
15000
5000
10
15000
75000
37500
18750
9375
4687
2344
1172
586
293
146
73
36
18
9
4.5
2.25
1.125
.562
.281
.140
.070
.035
.0175
.0087
.0043
.0021
.0010
.0005
.0002
.0001

1
2
4
8
16
32
64
128
256
512
1024
2048
4096
8192
16384
32768
65536
131072
262144
524288
1048576
2097152
4194304
8388608

804
15000
12000
9000
6000
3000
40401 | 150
806
12

2 15000 feet

1000 / 40000 / 4

.004 of ohm

or 1/250 of 1 ohm

16,777,216 — 0725
33554432 — 0362
67108864 — 0181
134217728 — 0090
268435456 — 0045

33000
.08
2640,00

30360
4554
25806
.08
2064,48

23741,52
1899,32
21842,20
.08
1747,37.6

92%
33000
2640
30360
.15
31800
30360
4554,00

25806,00
2064,48
23741,52
.08
1899,3216

21842,20
1747,37
20094,83

33000) 20000 (3
990

10000
.05
500,00

.60) 500. (833
450
200
187
200

33000) 20000 (60
1980
200

10000
.12
1200,00

60) 1200 (2000
120
0

33000) 200000 (5
179150
20850,00
179150
29350

36000
2880
33120
.15
4968,00

36000
.08
2880,00

33120
4968
28152
.08
2252,16

28152
2252,16
25847,84

25850
.08
2068,00

25850
2068
23782
.12
4756,4
23782
285384

23782
2854
20928

3
3
10000

4 % 10000

15000
3000
3000
6500
5000
15000
1000
2000
5000
10000
42000

76000
504000
20000

5000
35000
25000
2000
1000
1500
3000
3000
4000
600
2000
1000
1000
1500
5000
12000
1500
50100

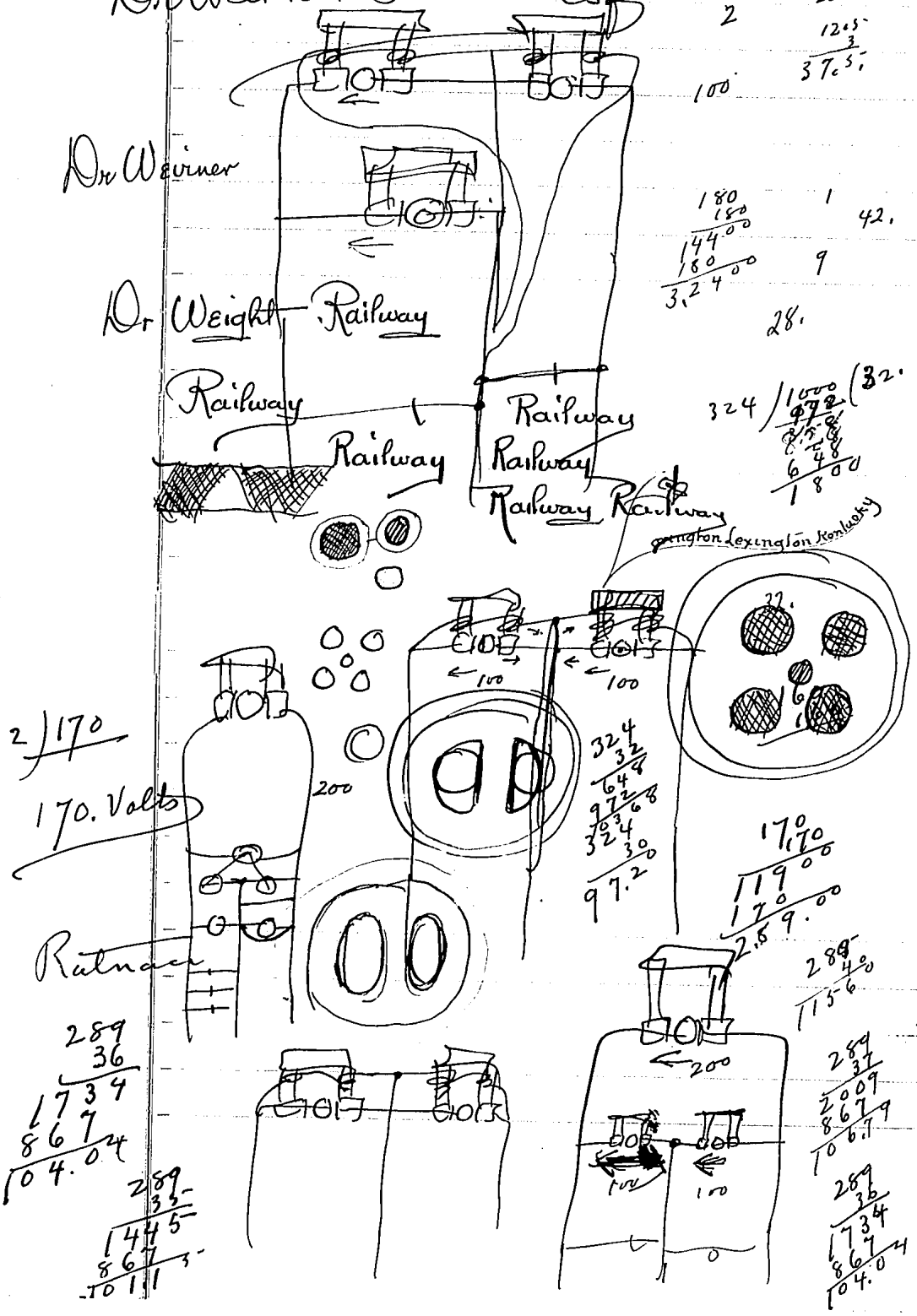
Ex unest -

80000
392000
364000
28000
600000
30000
20000
1514000

Bu Ex for 20000,

Dr Werner Siemens Esq

Dr Werner Siemens Esq



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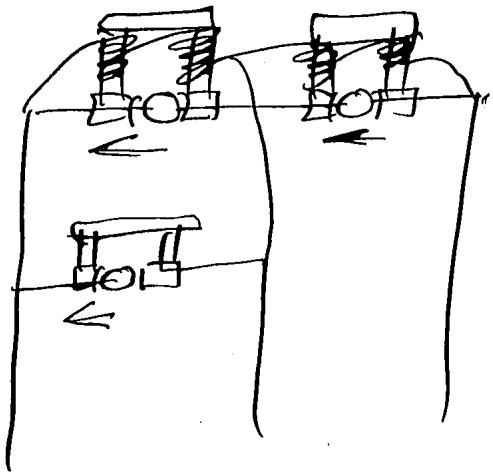
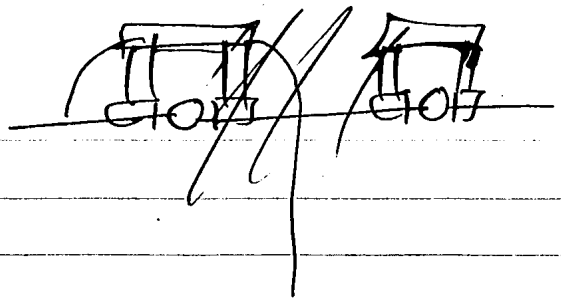
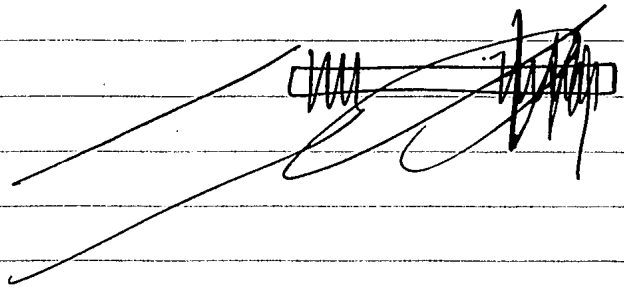
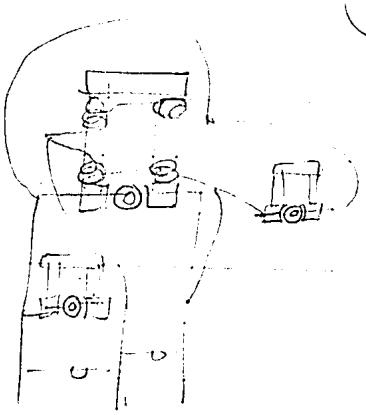
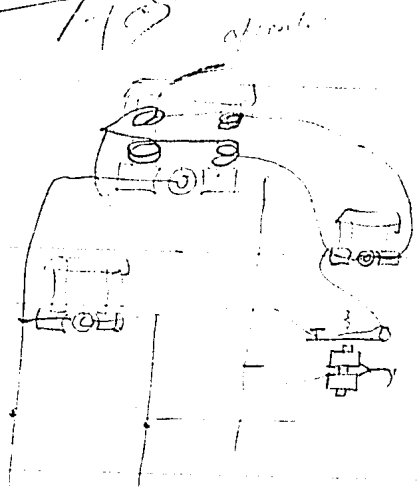


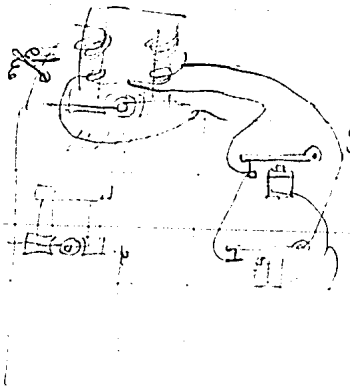


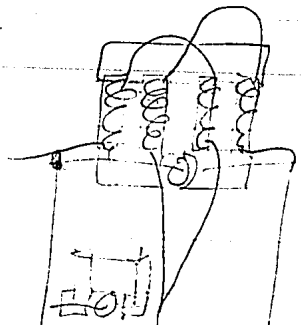


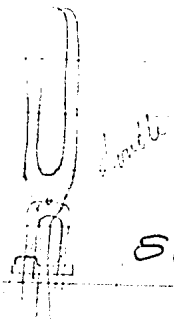
Concept NOV 1/89

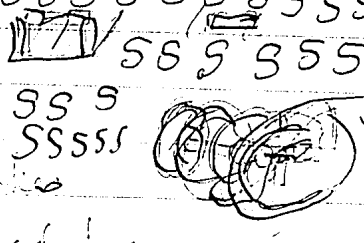




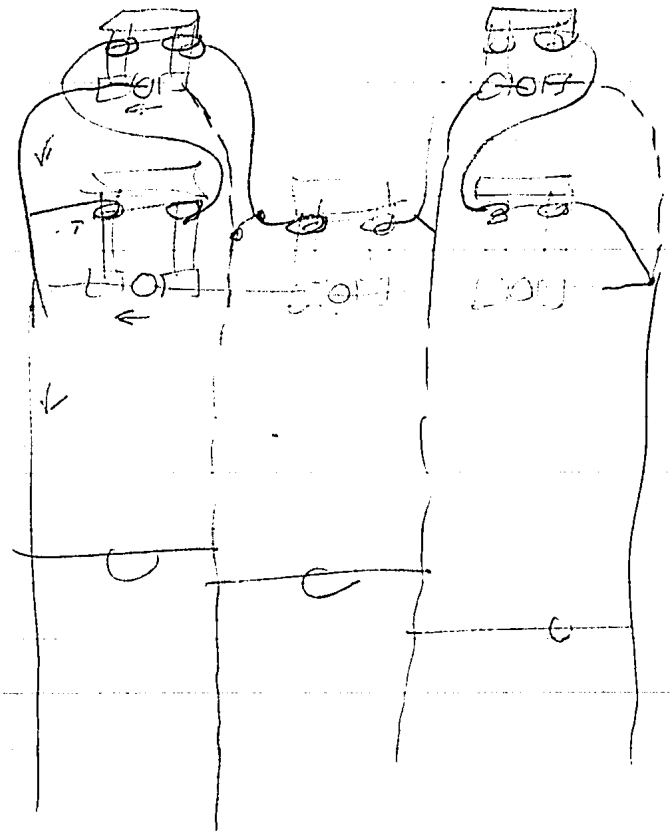


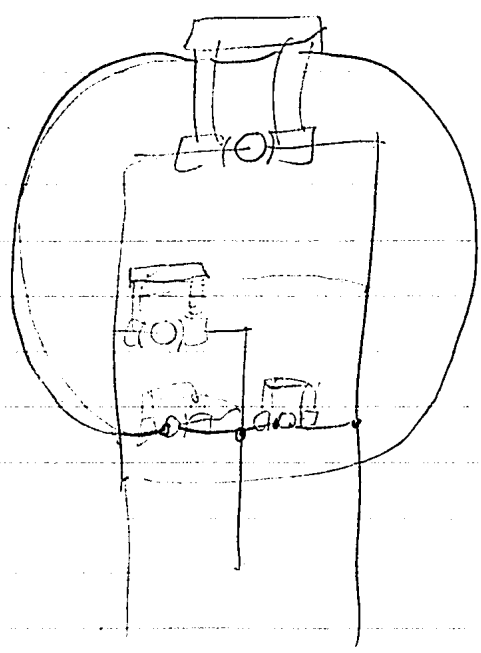


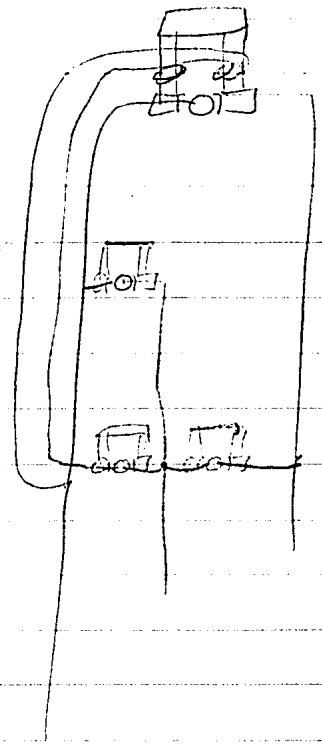


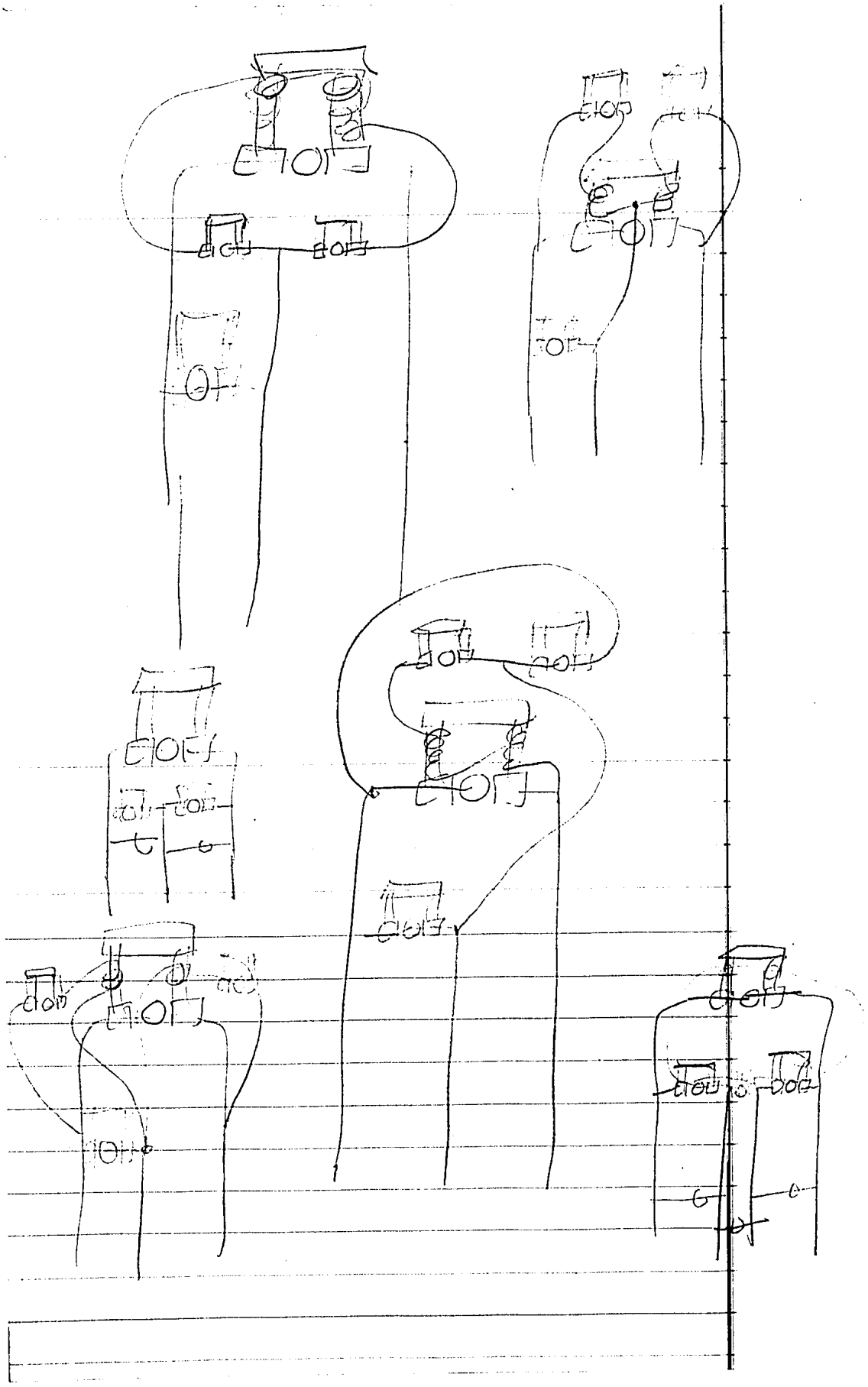


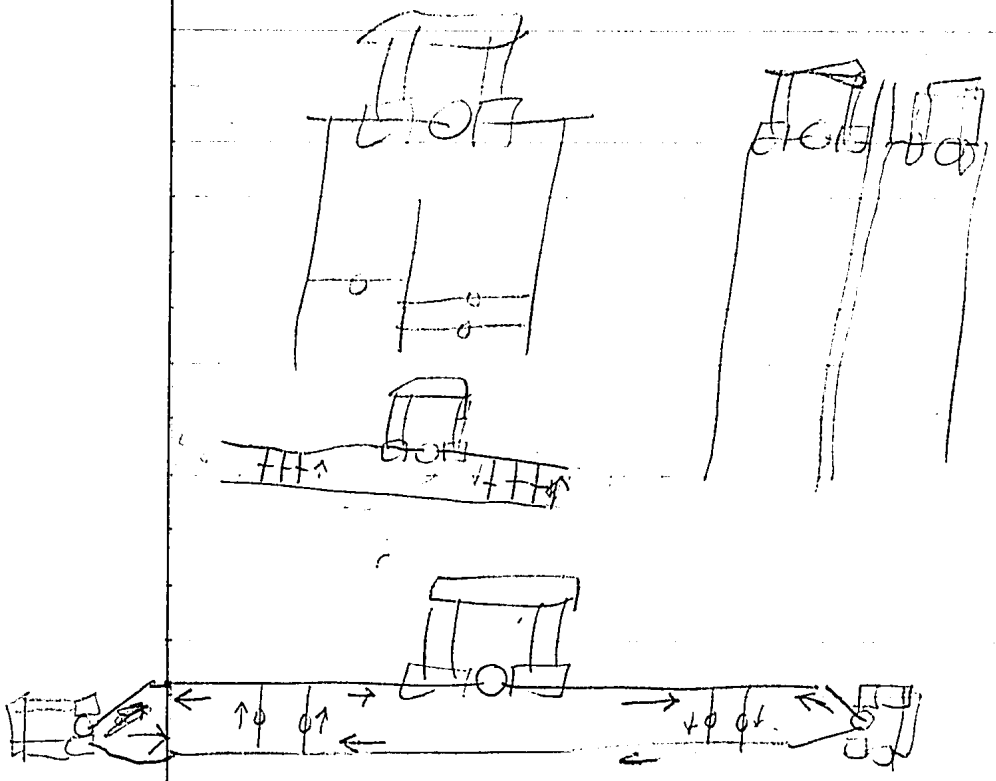
Disassembled view
in exploded drawings

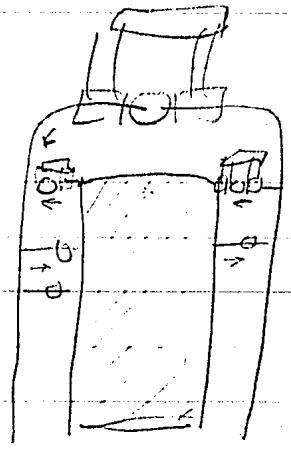












Oct 25 1886

Taken out patent for this

Use regular dynamo with regular brushes but they only serve to energize the field which does regulate by the resistance no lamp current is taken off of these, on the end of the shaft next commutator are two continuous contact disks secured to shaft & related together, on the surface which is continuous a ~~Gartad~~ brush rests, both ~~of~~ disks are insulated

from each other, & permanently connect one commutator bar to one disk & the commutator bar directly opposite on the other side of the commutator & connect to the other disk then at every revolution the current is reversed in the wires leading from the disks ~~which~~ while the regular commutator brushes take off a continuous current the two wires connected to the two disk contact brushes pass to a distant point say a mile etc.

There the two primary wires of converters are connected across multiple arc preferably although they can be in series, the secondary are connected in series to give say 200 volts, the centre wire being connected to earth thus I have a three wire system, of 2 wire the secondary are put in multiple arc the high tension machine is say 2000 volts

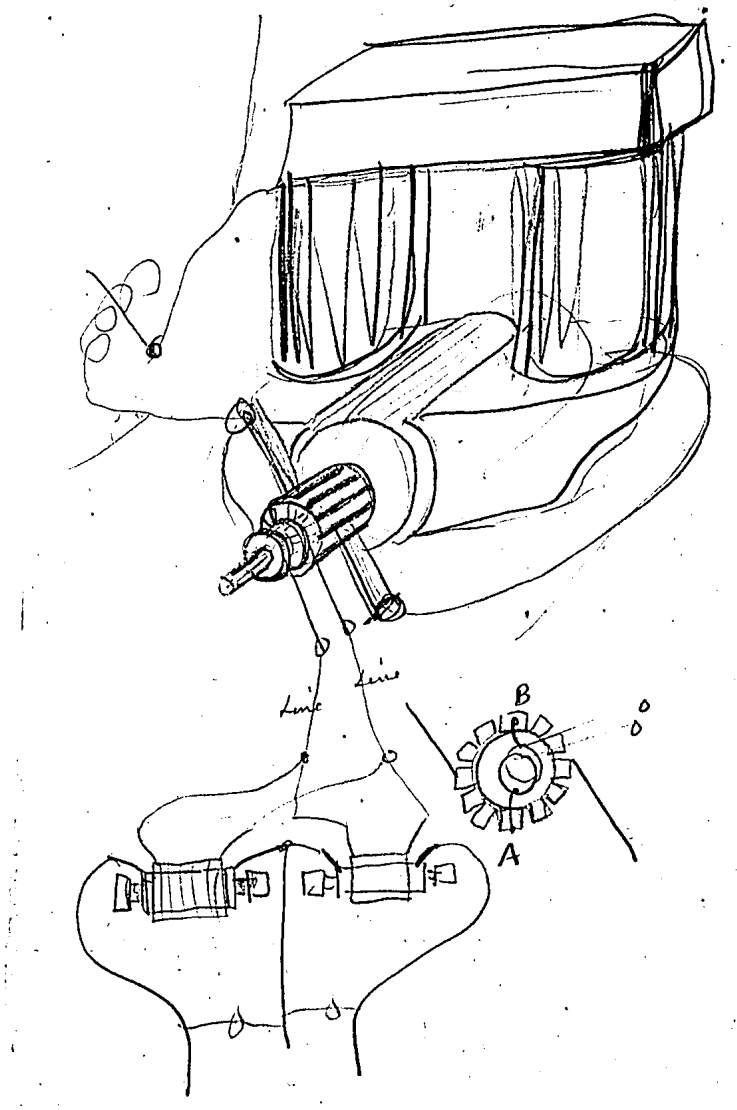
The Converters have large masses of iron in the form of fine wire wire or sheet, hence the slow reversals will not show in lamp, but perhaps if not necessary you need not vary as they about this way of quick around defect of slow reversals, — I intend to confine myself to using this machine in connection with converters as the lamps may be put on direct the tension being reduced of course to the regular

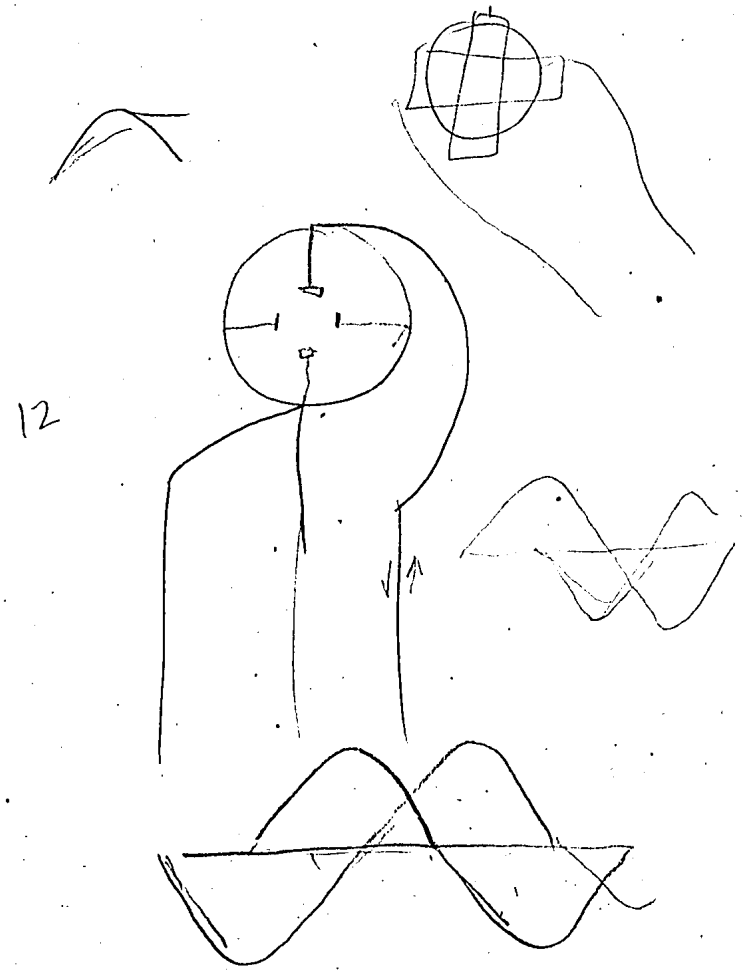
— October — 1886

required volts,

also I can in addition to putting on Lamps on the series circuit or when using the Carbon put lamps on the regular brush circuit —

Yours TUR


Line
Line
B
A


12

LAW OFFICES OF

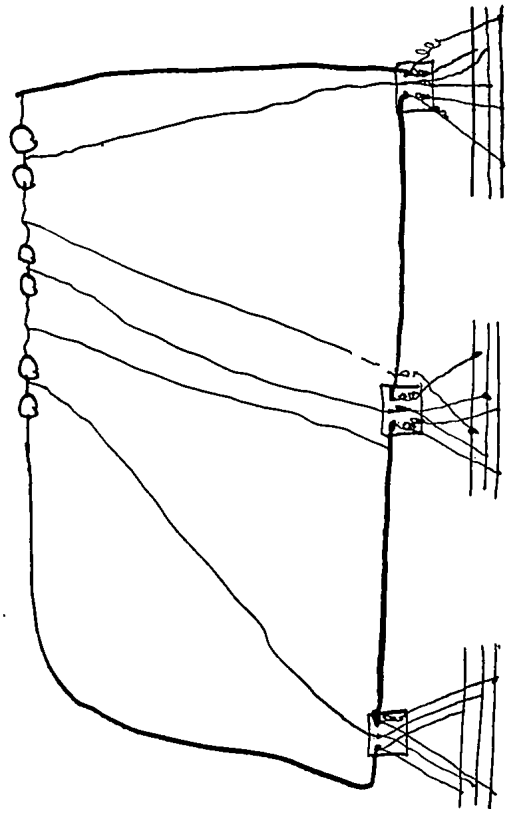
DYER & SEELY,

(PATENT BUSINESS EXCLUSIVELY)

Richard N. Dyer

40 Wall Street,

New York, Nov. 1 1886



November - 1886 —

LAW OFFICES OF

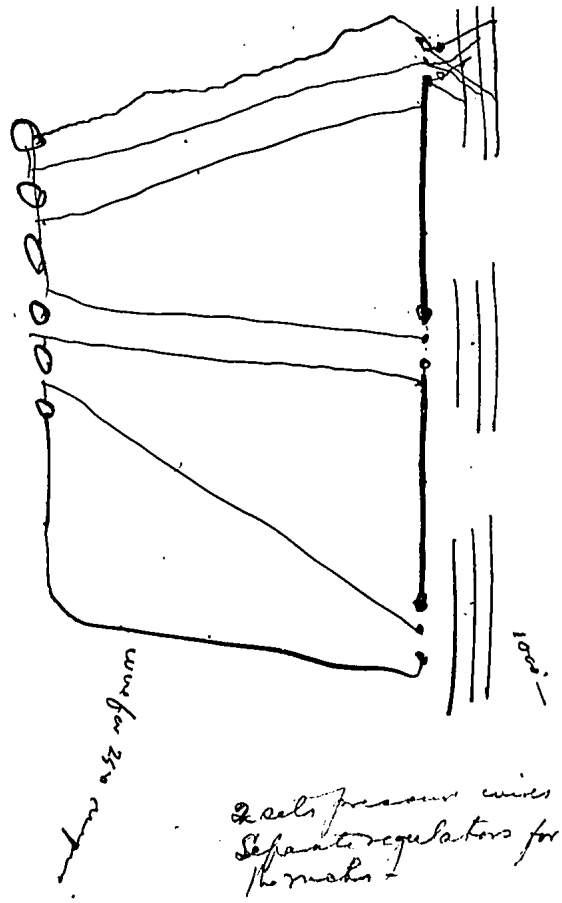
DYER & SEELY,

(PATENT BUSINESS EXCLUSIVELY)

Rich. N. Dyer

140 Wall Street,

New York, Nov 1 1886



2 sets pressure wires 25 ft.
Separate regulators for the mains.

November-1886-

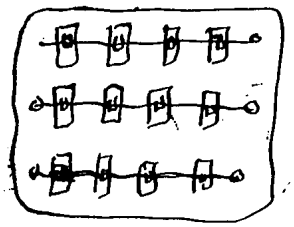
THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

Form L. 1200-2-13-'80.

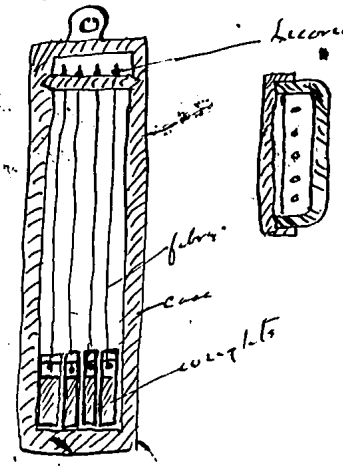
New York, ... 188

The object of this invention is to produce a filament of Carbon which shall have an even Carbonization and not become distorted ~~which~~ when Electrically heated.

The invention consists in so arranging the filaments that each shall be heated equally on all sides simultaneously directly by radiation and air currents, or indirectly by being placed in receptacles which shall be heated by air currents & radiation.



Mould
Hung full of boxes



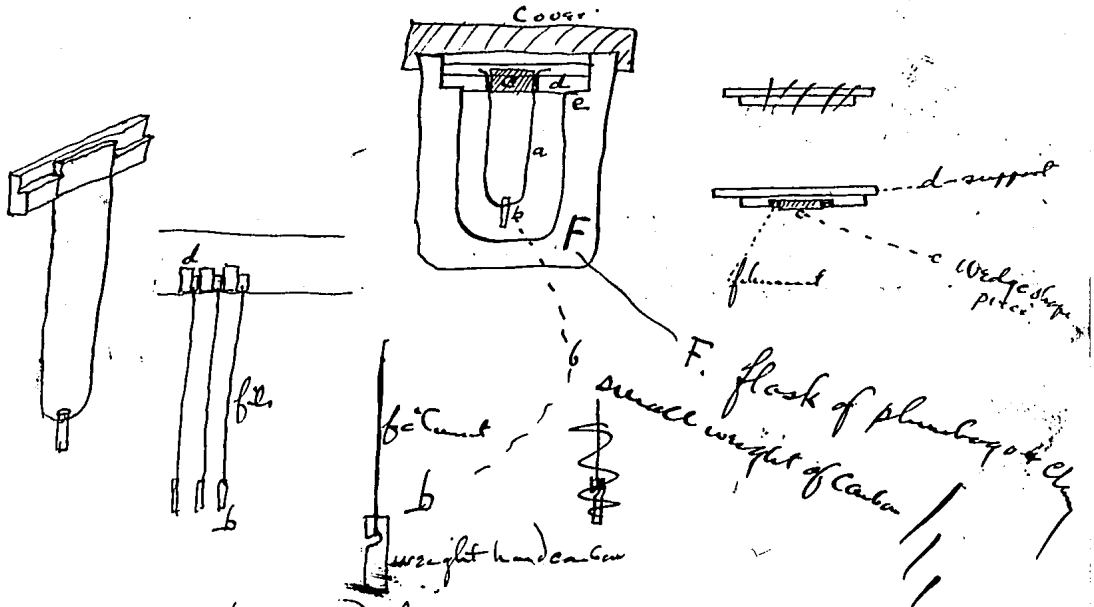
Top view

Form L. 1200-2-13-'80.

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

New York, Nov 7 188[illegible]

The object of this invention is to ~~obtain~~ Carbonize filiments for incandescent Electric lamps which will be of even resistance and will not become distorted while heated Electrically while in the lamp — and ~~will be in a bottle~~ ~~[illegible] the [illegible] of lamp~~ ~~The invention consists in carbonizing the filament~~ The invention consists in carbonizing the filament "entirely by radiated" "converted" heat, and not by conduction. The filament is suspended out of contact with any body in a carbonizing Chamber a small weight serves to keep it from distorting while being Carbonized thus preserving the shape originally given to the Carbonized filament,



Several hundred filaments in each mould

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

Form L. 1200-2-13-'80.

2 New York, ... 188

Soak the patent, make broadest claims',

Claim: Carbonizing carbonizable filaments by radiated & conducted heat. ——

Out of contact so no heat is conveyed to filament by conduction —

Suspended filament, bent or formed to shape originally & placed under strain while being carbonized to make it hold its shape' — —

P.S. The filament used in lamp is broken off about ¼ inch from point of suspension so that it ~~be~~ will be carbonized by radiation at the point & not by conduction from the support, — all carbonization heretofore of every body The filament was in contact with matter at some of its parts — our ~~complete~~ without exception use powdered charcoal, T.A.E.

Where are the other applications ??

Nov 16 1886
+ as

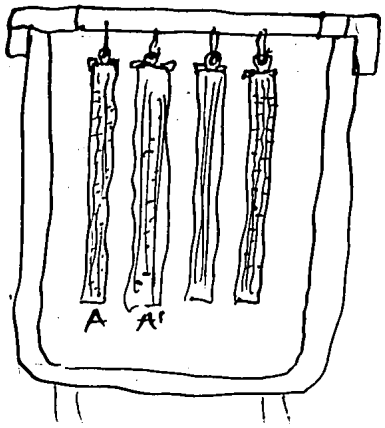
The object of this invention is to Carbonize Carbonizable filament for Incandescent Lamps which shall have an even Carbonization + not become distorted when heated electrically when Exhausting the globe of the lamp and also to make a better + more homogenous filament

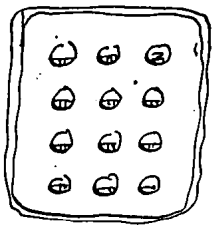
A Have Carbon cylinders or boxes round or flat in which straight filaments are ~~packed or~~ placed + then packed with powdered anthracite Coal or other form of Carbon — of good heat Conductivity, ~~or even a metal or other~~ or other material which will not be fused at a high heat such as Corundum Silica Etc, These boxes are rather small + contain only a dozen or so filaments The tubes are suspended by Carbon or other infusible hook + out of contact with each other so they are heated by air Convection Currents + radiation thus making an equal heat These tubes being suspended in a plumbago mould the mould in its turn is placed in another similar mould with air spaces, The outer mould receives the flame + heat the inner mould mostly by convection of air currents + radiation thus the second mould receives an even + equal heat.

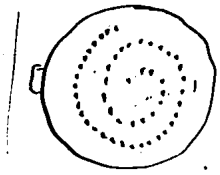
Claim — Carbonizing filaments by radiation + convection Currents —

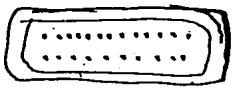
— The double box —

Nº of small suspended cylinders boxes etc with sufficient space so they are heated by Convection + radiation without Conduction — etc

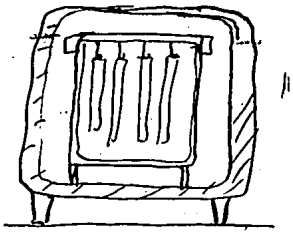








2. section of tube



November —1886—

Nov 16 1886 —

Seeley —

This is the new system only thing want to patent on this is, The use of an extra high tension main between the several stations so that in case of a break down on the main from the Central ~~station~~ or Steam station or in case repairs the station can be supplied from 1 or more stations by means of these break down mains. —

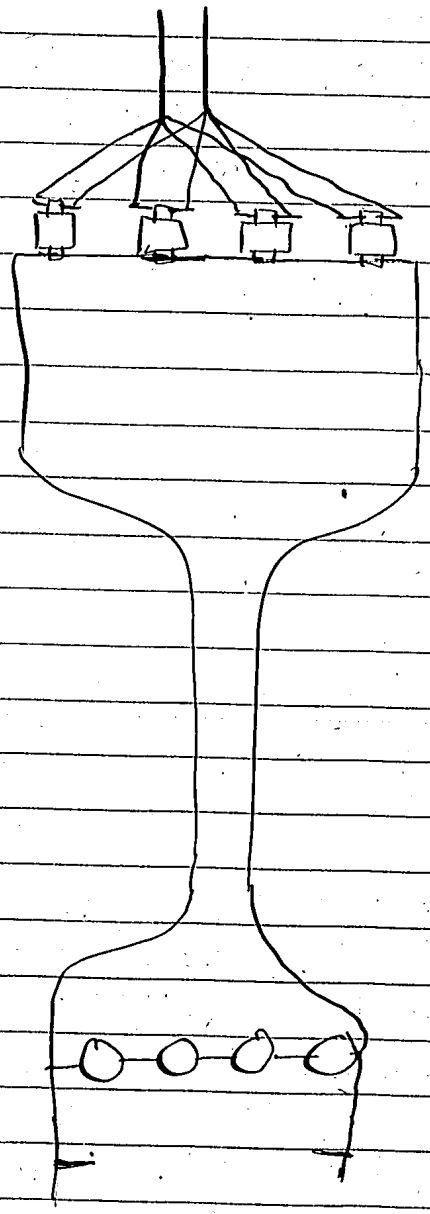
Also means of throwing the system of Dynamos at the steam station in Multiple arc (3 wire) with any other system, where say 3 stations use the same volt lamps they can all be thrown on one set Dynamos & Engines during the day for decreased consumption.

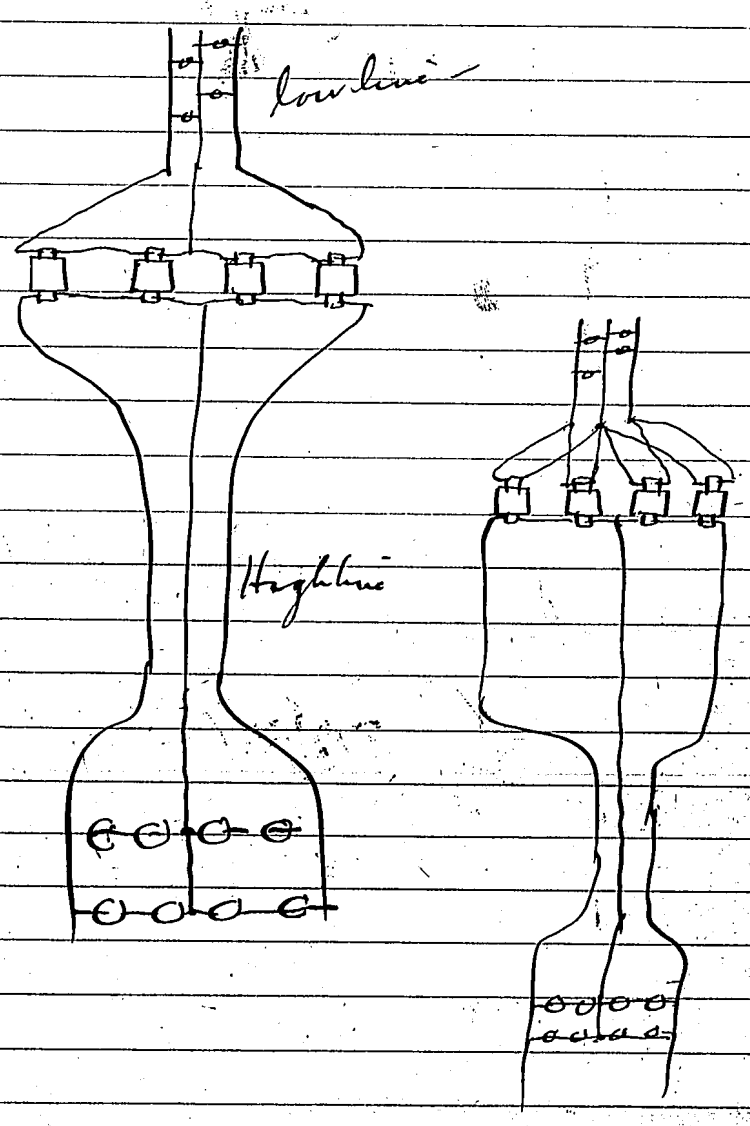
E

Seeley — N 020 1886 —

Here is some variations for a patent =
Converters in series on high line & other
or low coils multiple arcs Etc
you will comprehend

Tesla




low line
High line

The object of this invention is to obtain homogeneous carbon filaments for incandescent Electric Lamps. The invention consists in the use of the non volatile residues of the resins and bitumens which are Oxygenated Hydrocarbons, With or without infusible conducting or non conducting elements or Compounds.

The invention further consists in the manner of forming the Carbonizable filament and in the manner of carbonizing the same,

"of the Oxygenized residues of Resins and bitumens I prefer what is known as Asphaltene which is prepared from common refined Asphalt by heating the same at about 250 centigrade in the open air until the volatile matters are driven off - This is allowed to cool & is then broken up and very finely powdered, & is then put into a mould with a plunger from this mould there is a fine orifice through which the

Asphaltene may be forced
into a thin filament the
mould being heated to
the softening point of the
asphaltum, - The filaments
are then hung in small
Carbon boxes a number
of which are placed in a
chamber of Carbon. The
whole is heated for about
15 hours to a heat a little
below the softening point
until just before the volatile matter are
thus driven out &
then the heat may be

raised slowly without melting
or softening the filament
until the whole is thoroughly
Carbonized -

If the asphaltene just
before all the volatile matter
are driven off in the it
preparation is mixed with
pure finely divided
graphite. & then allowed
to cool ~~separate~~ pieces
may be put into the
filament forming pieces
without powdering &
by a high heat filament
formed out

In this case the filaments may be carbonized by the regular methods without previous drying slowly as the graphite prevents the ~~flattening~~ effects of soften of the asphaltene, ~~oxides~~ infusible oxides such as lime, magnesia alumina may be substituted for graphite when high resistance filaments are required.

I do not wish to confine my self to asphaltene as it is not an exact compound but claim generally the

heating of all Bitumens & Resins ~~substance~~ until nearly the whole of their volatile constituents are driven off stopping the heat just below the carbonizing or decomposing points. petroleum, Rosin etc. may be used —

If filaments are formed out of infusible oxides. They may afterwards be impregnated with asphaltene accomplish the same purpose The asphaltene being dissolved in Benzol or other good solvent which is volatile at low temperatures

Seeley —

2nd asphaltene the best substance for impregnating the clay filaments — you may have to divide this application as to for soaking How would it do to put all the claims in & then when we want to can make a division —

Claim formation of filaments from asphaltene or equivalent substance

2nd Combined with powdered carbon or graphite

3rd Combined with infusible substance

previously formed filaments of carbon or infusible non-conducting materials impregnated with asphaltene in proper solvent,

Etc

Nov 21 1886

T.E.S

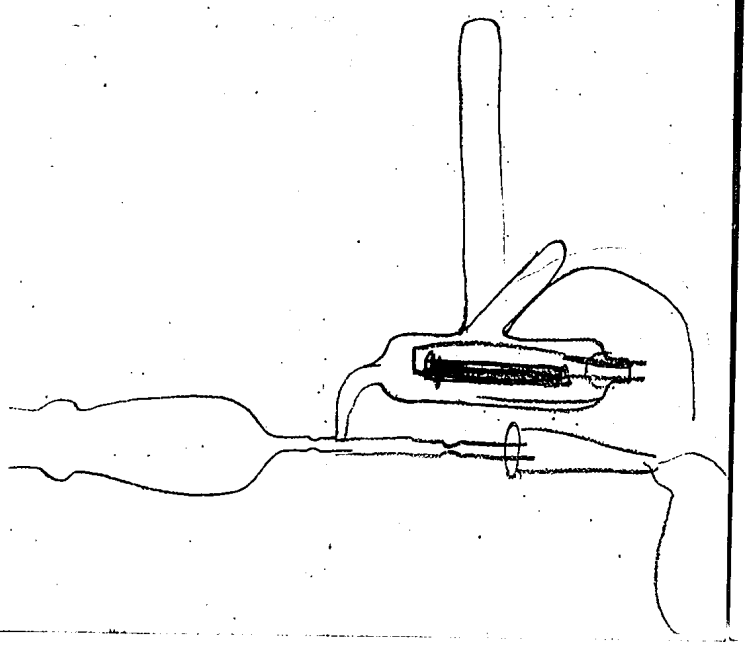
107

The object of this invention is to make filaments of carbon for incandescent electric lamps which shall be of even texture & of high electrical resistance.

The invention consists of the method of forming the Carbonizable filament, by first taking a filament of some substance which is soluble in liquids which do not act on the Carbonizable material to be placed on its surface for instance Boric Acid can be drawn out when hot into very fine perfectly cylindrical filaments. If these be bent in proper form they may be coated with many concentric layers of carbonizable material, for instance if the Boric acid filament be immersed in a solution of Asphaltene in Benzol, once & then allowed to dry which it does quickly it may again be immersed & a second coat put on - each coat

can be made exceedingly thin according to the dilution of the solution after a sufficient thickness of Carbonizable material is obtained the whole is thrown into water which dissolves the Boric acid & leaves the filament of asphaltene with a hole in the centre ready for carbonization, as the hole in the centre narrows the resistance of the filament a saving in Conductors is obtained owing to the great number of concentric layers any defect in one layer is rendered a small factor. It is evident that if tubes of Boric acid be heated and drawn out into filament the will be hollow & if the liquid containing the Asphaltene be drawn through at intervals it will deposit on the inside of the glass tube - In this case the Boric acid is

over



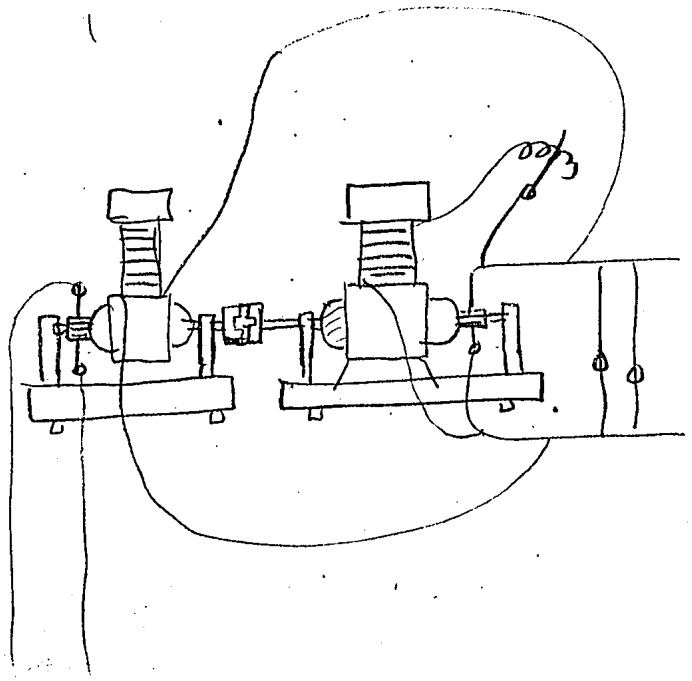
dissolved very much quicker
I have spoken of Boric acid ~~as~~ a former & Asphaltene as the Carbonizable material, but it is evident that these materials can be changed in almost Endless ways.
If melted Rosin be drawn out into filament, It may be coated with layers of Licorice dissolved into, gum Dextrine starch, Tragacanth, Arabic, then if thrown into spirits Turpentine The Rosin may be dissolved out,
It is not ~~even~~ necessary to dissolve the Rosin out as the whole is Carbonizable, ~~Silk, [illegible] Wool [illegible]~~ all that is necessary is that there should be a smooth substance carbonizable or salvable on which to

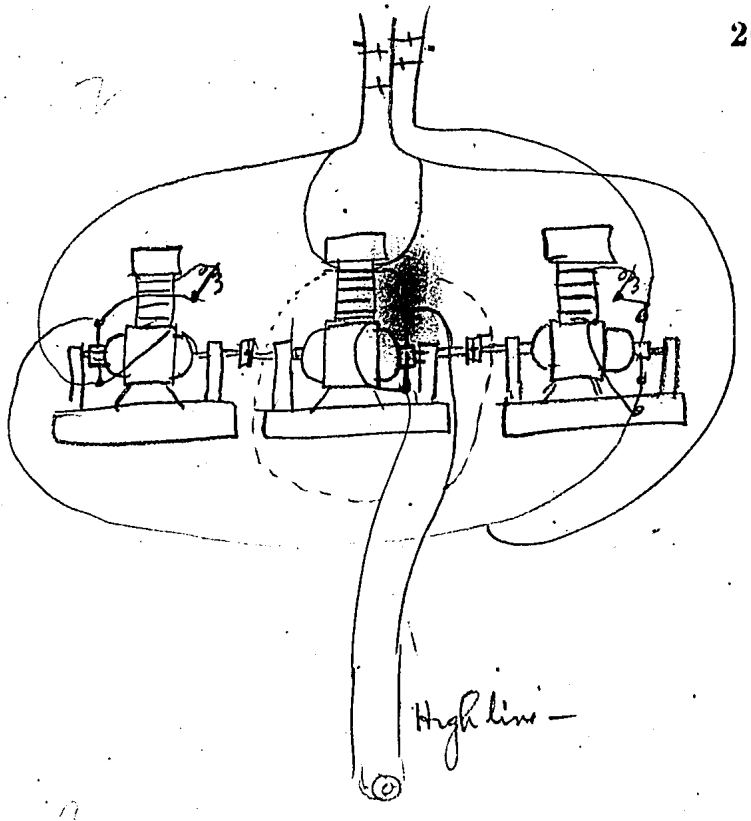
build up the main portion of the filament by successive concentric films of the material the solvent of which volatilizes,

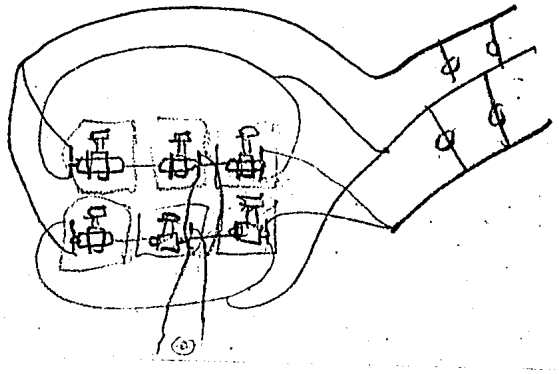
Now friend Dieby can you get a broad claim to this process — concentric multiple layers hollow-carbon — dissolvable former or carbonizable m — etc etc,

Nov 21 1886

T.A.E




High line



Deeley — Nov 17 1886 T.C.

Want to get all the claims possible on this method of working from high to low currents. be careful in drawing patent not to call this a tension reducer. — It is a motor system driving a Dynamo mechanically make this distinction broad. so they cannot recite Ayrton & Perry's old suggestion of Motors driving dynamos as a current reducer —

The pith of the invention is 1st — a motor worked by high electromotive force driving by direct connection a Dynamo giving out low volts.

2nd Insulating joints in shaft or means so that the high line is absolutely insulated from the low line, + arranged so that no cross can occur — The Earth intervening would in case the wire or armature come in contact with the base prevent any Emf from entering the 2nd ckt in fact the circuits could be miles apart as far as crossing is concerned. (see 5)

3rd Placing all the Motors in Multiple arc — string claim — or on 3 wire

~~4th one motor drives~~ —
system which is practically
same thing —

4th - arranging one motor
to drive two machines as
well as one - ~~also~~ This gives
a 3 wire unit —

5 = Energizing the fields
from the dynamos ~~both~~
and Motor from the low
Current,

6 - also Energizing the Motor
field from its own ckt
Dick will tell you what
I want to put this patent in
for —
E

Decley —

Nov 26 1886

The object of this invention is to ~~d~~ increase the quantity of iron in the rotating armature of a dynamo machine or rotating Commutator and at the same time not increase the strength of the Foucault Currents in the iron — Heretofore the iron plates which make up the core have been separated by paper

The invention consists in Coating each plate by a varnish which will not shrink or crack at a high temperature

~~Stamp~~ which shall be a good insulator of Electricity and a good Conductor of heat so as to allow the heat to be rapidly conducted to the surface —

After the plates have been stamped out & the burrs taken off they are dipped in a hot solution of Asphalt or Asphaltene in Turpentine Benzol or other Volatile Solvent The film dries almost instantly is exceedingly tough stands a high temperature + ~~varnish~~ ~~Varnish~~ may be safely reduced to 1/3000 of an inch thick

The plates are all assembled on the shaft and by means of bolts are gradually brought in intimate contact while the armature is in a hot chamber. The heat serving to drive off all traces of the solvent used. The film left will sustain a heat of over 400 degrees Fahr without softening or running out of the plates and is sufficient tough to prevent any burrs from being forced through it, so as to make electrical contact with the adjacent

plates — ~~The method of the distillation of petroleum~~ ~~tar~~ almost all of the Bituminous or partially decomposed Resins in proper solvents will answer, but I prefer ordinary Asphalt boiled to drive off some of the volatile Constituents

Claim The method of ~~insulating~~ electrically insulating the iron armature plates of Dynamos by Coating them with an insulating ~~varnish~~ varnish

The use of Asphalt in proper Solvent,

Heating armature after assembled ~~to~~ ignition etc

November

Nov 28 1886

Seeley

In the future some Westinghouse + Byllsby make seek to evade the Cameron patent by running a dynamo by a motor now if they do it by a belt they might evade the patents as I understand Gordon suggested it in 1879 — Now I want to cover the only practicable way to do it & in addition connect it to our 3 wire system & so combine it that I can cover it through combination with other essential feature in any system such as feeders, etc —

I send you sketch, but you must making drawing showing a distributing system feeders, feeder Regs — pressure wire —

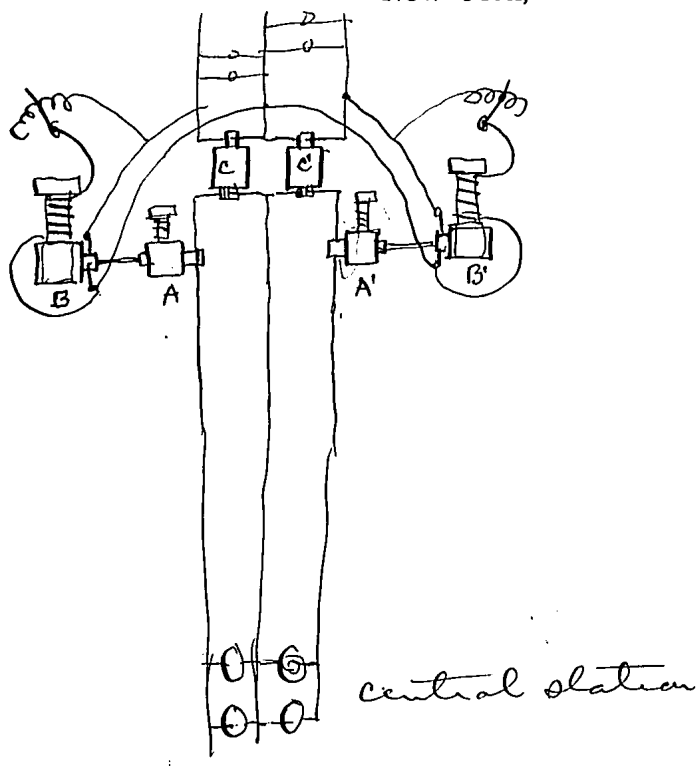
The advantages of this system is that one system can be absolutely insulated from the other — an insulating joint between the two machines. — also the pressure in the low line can be regulated by varying its field magnet which is not the case in Revolving Converters,

3rd Chap Direct Connection from shaft to shaft of Motor + Dynamo — Workshop fad

Form L. 1200-2-13-'80.

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

New York, ... 188



Object of patent regulation of the EMF at the reducing station while that at Central Station is constant –

A A' are two ~~dynamos~~ Motors wound so that a 1/2 speed they give a minimum Counter Electromotor force

B are Motors which are run from the low tension line, — when the Volts are to be increased or diminished on the high line – the fields of B

Form L. 1200-9-18-'86.

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

2

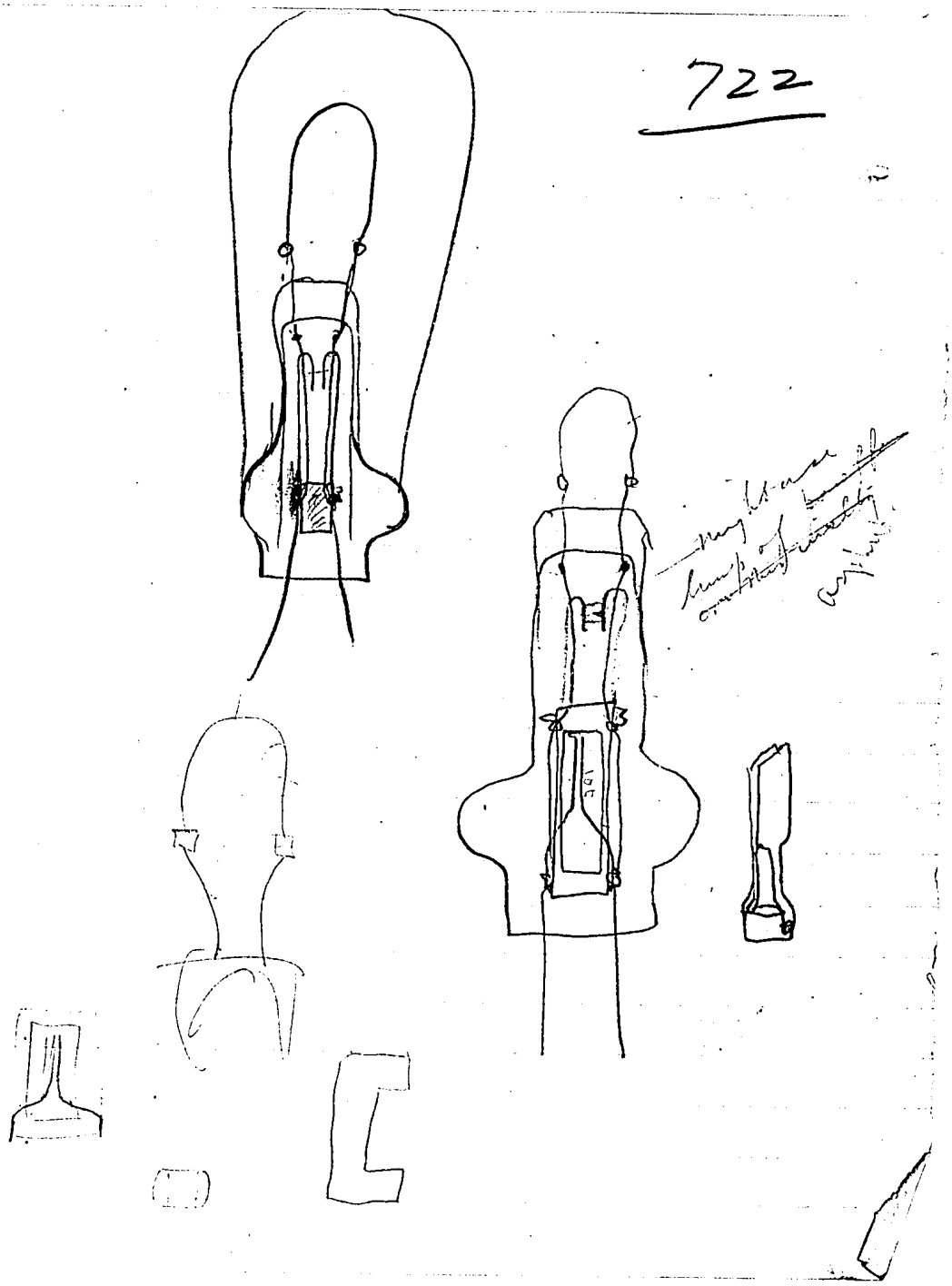
New York, 188

are increased or diminished in strength & thus the Motor B runs at a higher or lower speed - thus causing A to give greater or lesser Counter EMF or back pressure
Thus if the Central station has a Constant of 2500 volts & A a Counter pressure of 500 volts, The net will be 2000, if now there is a fall of pressure due to load The strength of the field of B is increased, the speed of A diminished & the back pressure diminishes thus bringing the pressure up to the required amount,

Nov 29 1886
TAE

Nov. 30 86
N.H.Bailey

722



— Dec 18 1886 —

Patent — D. S.

Rec'd 86

The object of this invention is to produce mother of pearl surfaces artificially —

The invention consists in forming ~~by stamping~~ a flat plate of mother of pearl formed of one or more pieces the whole resting on a hard flat surface.

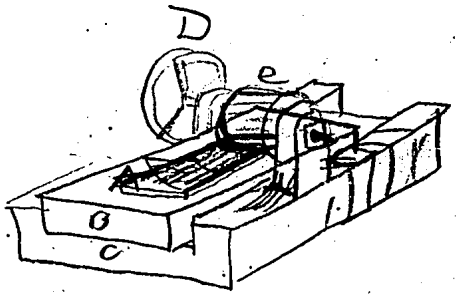
Impressions being taken from the face of the mother of pearl on plastic sheets or material by pressure ~~similar~~ the apparatus used being similar to a Lithographic press —

The colors of mother of pearl being due to minute wavy lines formed by alternate layers of lime & animal matter the depression between the lines being quite sufficient to causes a perfect impression on the plastic surface of the sheet or material pressed on it

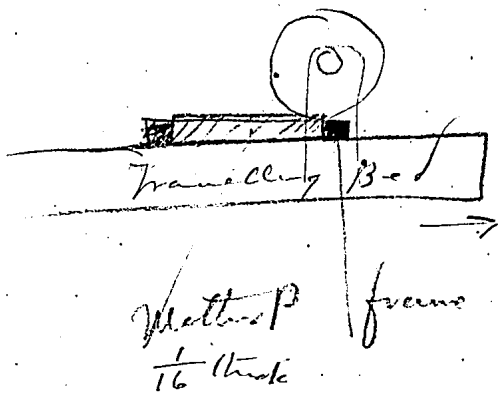
I have discovered that not only are the many thousands of lines accurately transferred but that the lime like appearance is transferred as well — If a mirror like sheet of tin foil be impressed on the mother of pearl it will have the exact appearance of the same and its metallic ~~characters~~ appearance is entirely destroyed

Metallic foil, Celluloid ~~but~~ and other plastic materials may be printed as above used for ornamentation

Picture frames fans and in fact take the place of gold foil - Brittania Metal table ware & innumerable other articles can be given a mother pearl surface by this means -



e is the steel roller - B the travelling platen C the frame D the wheel A the Mother pearl in frame — The tin foil being laid on M pearl block is printed just like lithograph



Can you claim the art of printing from Mother pearl also a new article manufactured Mother pearl surface or foil —
The process - ought get Broad claims or else is

— December. — 1886 —

new art -

Mem — It works splendid — have made machine It is possible to rule fine lines in a wavy manner by diamond tool and a dividing Engine all on steel or other hard metal which will imitate M pearl - should you speak of this, in the applen I intend take out another patent on it -

TAE

Bill to me personally